TESTS: 250 MX COMPARISON: HONDA CR250R, KAWASAKI KX250, SUZUKI RM250, YAMAHA YZ250 PLUS HONDA NIGHTHAWK S, BMW K100

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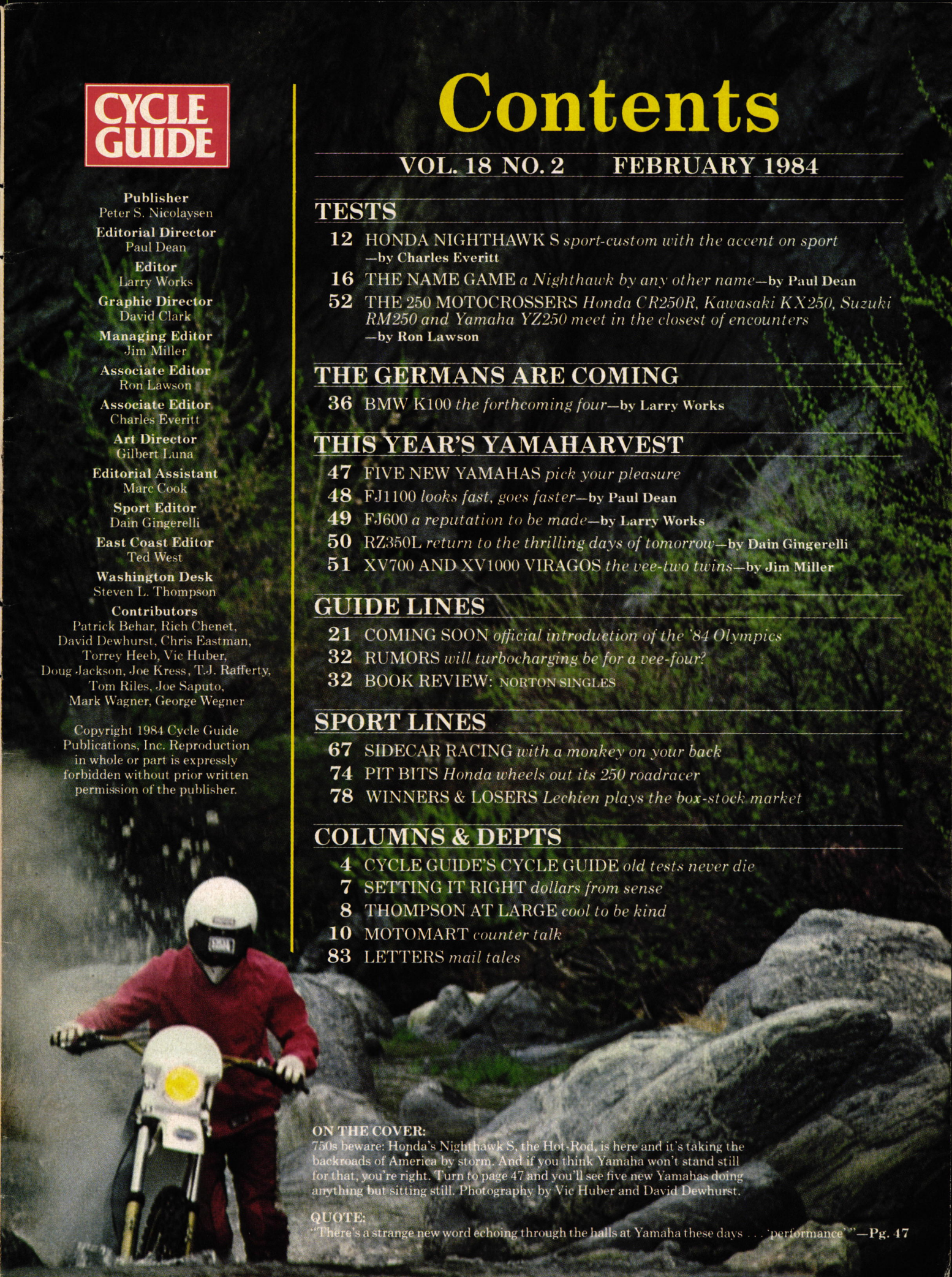

ON THE COVER:
750s beware: Honda's Nighthawk S, the Hot-Rod, is here and it's taking the backroads of America by storm. And if you think Yamaha won't stand still for that, you're right. Turn to page 47 and you'll see five new Yamahas doing anything but sitting still. Photography by Vic Huber and David Dewhurst.

QUOTE:
"There's a strange new word echoing through the halls at Yamaha these days . . . 'performance' "—Pg. 47

CYCLE GUIDE'S CYCLE GUIDE

Cycle Guide's catalog of recent test hardware—no brag, just fact.

OFF-ROAD

MAKE & MODEL	ISSUE	TYPE	ENGINE TYPE	WHEEL TRAVEL, IN. FRONT/REAR	WEIGHT, LBS.	RAKE/TRAIL, DEGREES/INCHES	GEARS
Cagiva WMX250-'84	January '84	Motocross	Two-stroke	11.9/12.7	221	28.0/4.65	6
Can-Am Sonic MX-'83	January '83	Motocross	Four-stroke	11.6/12.1	272	28.0/4.24	5
Honda ATC200X-'83	August '83	ATV	Four-stroke	7.2/6.2	285	N/A	5
Honda CR125R-'83	April '83	Motocross	Two-stroke	10.9/12.3	193	27.2/4.13	6
Honda CR250R-'84	February '84	Motocross	Two-stroke	11.7/12.2	216	26.7/4.13	5
Honda CR480R-'83	May '83	Motocross	Two-stroke	12.0/12.3	226	26.0/3.86	5
Honda XR350R-'83	June '83	Enduro	Four-stroke	10.9/10.4	253	26.0/3.94	6
Honda XR500R-'83	October '83	Desert	Four-stroke	11.0/12.2	278	25.5/3.94	5
Husqvarna 250 CR-'83	January '83	Motocross	Two-stroke	11.8/12.7	227	30.0/5.51	6
Husqvarna 430 WR-'83	June '83	Enduro	Two-stroke	10.4/10.6	246	30.0/5.98	6
Husqvarna 500 CR-'83	May '83	Motocross	Two-stroke	11.8/12.8	240	30.0/5.51	4
Husqvarna 500 XC-'83	October '83	Desert	Two-stroke	11.7/12.8	245	30.0/5.98	6
Kawasaki KDX200-'83	July '83	Enduro	Two-stroke	9.8/11.0	213	28.0/4.76	6
Kawasaki KDX250-'83	November '83	Enduro	Two-stroke	10.1/10.7	232	29.0/5.00	6
Kawasaki KX250-'84	February '84	Motocross	Two-stroke	11.6/12.3	220	28.5/4.65	5
Kawasaki KX500-'83	May '83	Motocross	Two-stroke	11.7/11.9	232	29.0/4.80	5
KTM MC 495-'83	May '83	Motocross	Two-stroke	11.9/12.4	249	28.0/4.21	4
Maico 490 Sand Spider-'83	October '83	Desert	Two-stroke	12.0/12.7	243	27.0/4.72	5
Maico 490 Spider-'83	May '83	Motocross	Two-stroke	11.8/12.2	240	27.0/4.72	4
Suzuki ALT50-'83	June '83	ATV	Two-stroke	N/A	90	N/A	1
Suzuki RM125-'83	October '83	Motocross	Two-stroke	10.7/11.8	200	29.5/4.76	6
Suzuki RM250-'84	February '84	Motocross	Two-stroke	11.8/12.9	220	27.8/4.41	5
Suzuki RM500-'83	May '83	Motocross	Two-stroke	11.9/12.8	234	29.7/4.84	4
Yamaha IT250-'83	November '83	Enduro	Two-stroke	11.0/11.3	233	28.0/4.65	6
Yamaha TT600K-'83	August '83	Trail	Four-stroke	11.7/10.8	280	28.0/4.65	5
Yamaha YZ250-'84	February '84	Motocross	Two-stroke	11.3/12.6	214	28.0/4.69	5
Yamaha YZ490-'83	May '83	Motocross	Two-stroke	11.8/12.5	227	28.5/4.72	4

STREET

MAKE & MODEL	ISSUE	ENGINE TYPE*	DISPLACEMENT, CC	QUARTER-MILE, SEC./MPH	TOP SPEED, MPH	WEIGHT, LBS.	FUEL CONSUMPTION, MPG	STOPPING DISTANCE FROM 60 MPH, FT.
BMW R100RT-'82	May '82	2C/G	979.9	13.862/95.13	126†	523	35–50	148
H-D FXRS Low Glide-'84	January '84	45 deg. 2D/F	1337.7	13.917/94.57	112	575	38–48	140
H-D FLH Classic-'82	August '82	45 deg. 2D/F	1337.7	15.467/82.04	101†	752	32–42	180
H-D XLS Roadster-'83	April '83	45 deg. 2D/F	997.6	13.842/93.94	106	515	43–55	138
H-D XLX-61-'83	June '83	45 deg. 2D/F	997.6	13.459/95.94	106	488	40–72	128
Honda CBX400F-'82	October '82	4A/F	399.1	13.588/96.46	110	402	34–58	128
Honda CB1100F-'83	January '83	4A/F	1062.2	11.224/119.84	144†	550	33–46	135
Honda CX650 Custom-'83	May '83	80 deg. 2E/G	673.5	12.560/102.97	119	454	38–48	124
Honda CX650 Turbo-'83	March '83	80 deg. 2E/G	673.5	12.093/111.66	137†	538	25–44	124
Honda FT500 Ascot-'82	August '82	1 B/F	497.7	14.915/83.72	97†	360	47–54	146
Honda GL1100A Aspencade-'83	February '83	4C/G	1085.0	13.515/96.05	152†	752	32–46	131
Honda Nighthawk 550-'83	July '83	4A/G	572.3	12.461/102.97	114	429	37–49	125
Honda Nighthawk 650-'83	December '83	4A/G	656.0	12.287/108.04	122	451	29–51	127
Honda Nighthawk 700-'83	February '84	4A/G	696.7	12.048/109.75	125	492	28–45	125
Honda V45 Interceptor-'83	May '83	90 deg. 4D/F	748.1	11.963/111.66	138	511	31–40	116
Honda V45 Sabre-'83	September '83	90 deg. 4D/G	748.1	12.179/111.11	128	514	33–46	130
Honda VF400F-'83	September '83	90 deg. 4D/F	399.1	13.588/96.35	112	402	34–51	127
Honda VT500 Ascot-'83	October '83	52 deg. 2D/G	490.9	13.628/93.75	112	411	41–61	129
Honda VT750C Shadow-'83	April '83	45 deg. 2D/G	749.6	12.906/100.78	127	484	48–55	132
Kawasaki GPz550-'83	June '83	4A/F	553.8	12.647/102.97	132†	438	42–62	144
Kawasaki GPz750-'83	February '83	4A/F	739.0	12.167/109.22	134†	498	35–51	136
Kawasaki GPz750 Turbo-'83	July '83	4A/F	739.0	11.225/123.53	146	514	N/A	N/A
Kawasaki GPz1100-'82	May '82	4A/F	1089.8	11.328/119.36	137†	534	35–48	127
Kawasaki KZ550 Spectre-'83	May '83	4A/G	553.8	13.348/96.77	116†	441	44–56	137
Kawasaki KZ750-L3-'83	January '83	4A/F	739.0	12.095/108.95	134†	487	47–53	132
Kawasaki KZ1000R-'82	November '82	4A/F	998.6	11.849/116.73	134†	505	35–49	129
Laverda RGS 1000-'84	December '84	3A/F	980.8	12.565/106.50	130	556	25–40	140
Suzuki GS450E-'83	January '83	2A/F	448.2	14.236/93.16	106†	384	39–49	131
Suzuki GS450G Automatic-'83	February '83	2A/G	448.2	16.412/82.34	94†	410	36–59	143
Suzuki GS550E-'83	June '83	4A/F	572.3	12.593/104.04	120	443	39–47	135
Suzuki GS650M Katana-'83	November '83	4A/G	673.9	13.238/101.01	122†	491	49–60	137
Suzuki GS750E-'83	August '83	4A/F	747.4	11.893/112.92	131†	485	35–50	135
Suzuki GS1100E-'82	May '82	4A/F	1074.9	11.203/119.30	141†	530	37–49	132
Suzuki GS1100G-'82	September '82	4A/G	1074.9	11.919/114.21	137†	555	42–48	138
Suzuki GS1100GK-'82	October '82	4A/G	1074.9	12.579/104.52	137†	647	31–44	155
Suzuki XN85 Turbo-'83	March '83	4A/F	673.9	12.381/107.14	132†	521	34–46	120
Yamaha RZ350-'83	December '84	2A/F††	347.4	13.343/98.46	112	346	N/A	N/A
Yamaha XJ650 Turbo-'83	March '83	4A/G	653.4	13.059/103.32	126†	543	35–53	126
Yamaha XJ900 Seca-'83	September '83	4A/G	853.2	11.949/113.20	128	499	34–58	135
Yamaha XS400 Seca-'82	December '82	2A/F	399.4	14.589/89.28	110†	382	47–57	140
Yamaha XZ550R Vision-'83	November '83	70 deg. 2D/G	552.9	13.422/95.23	112	483	39–47	124
Yamaha 920 Virago-'83	April '83	75 deg. 2D/G	920.0	12.835/101.46	108	503	38–45	138
Yamaha Venture Royale-'83	November '83	70 deg. 4D/G	1197.6	12.662/102.73	124	739	29–44	153

*A-Transverse Vertical, B-Vertical (single-cylinder only), C-Horizontally Opposed, D-Tandem Vee, E-Transverse Vee, F-Chain Final Drive, G-Shaft Final Drive, H-Belt Final Drive

† indicates a calculated top speed; †† indicates a two-stroke engine

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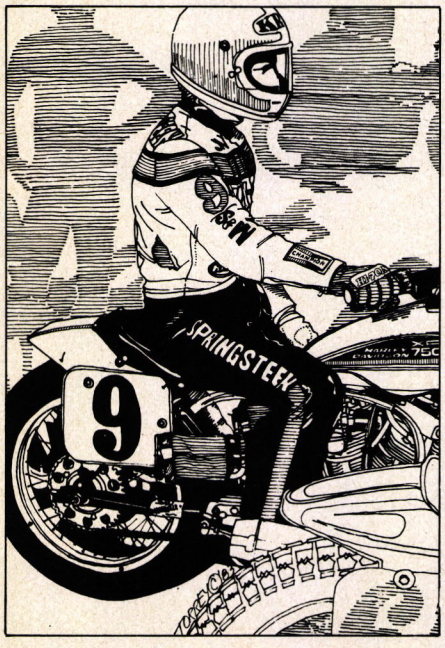

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Setting It Right

The Logic Of Unintended Consequences

Is the real cost of high-tech motorcycles figured in dollars—or sense?

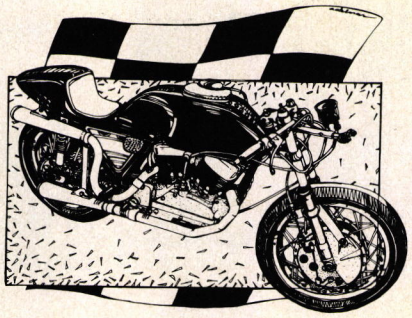
• Progress cannot maintain its forward direction; sooner or later it has to go sideways. And when one of these lateral moves in the chess of engineering becomes apparent (or imminent), we are forced to look more clearly at what we have achieved, and what it was that we originally set out to do.

The truths then discovered can be most unpalatable, but there is seldom any excuse for finding them surprising. Parallels and analogs abound in other disciplines, in the rises and falls of other forms of engineering in general and transport in particular. Thus I realized, while lecturing to thermodynamicists recently, that the motorcycle is not only no longer what it used to be but also less what it *ought* to be.

The subject was heat engines, and I was explaining the ways in which various attempts to garner more of the heat energy passing through them had met with only limited success. One of the most popular methods has been to employ an exhaust turbine to recover some of what otherwise would be squandered down the wastepipe. Motorcycling today is, in this respect, where aero engines and diesels were 50 or 60 years ago: It is apparent that the simple addition of a turbocharger is not enough. When the turbo is at work, it does increase the expansion ratio (the phase during which the work is derived from the combustion of the fuel); but the frequency with which the wastegate opens when it is at work, and the prevalence of times when it is doing nothing, show that merely using the turbine to drive a charge compressor is not efficient.

I believe the Wright Turbo Compound was the first engine to give expression in production to theories that had been the delight and despair of the leading thinkers in the aero-engine industry a decade earlier. What they did, to be emulated later in marine and tank engines, was to have the engine drive the supercharger in the good old-fashioned way, and to couple the turbine to the engine output shaft.

As they foresaw, the increased backpressure from the turbine prompted higher supercharger pressures and thence more power, leading in turn to greater mass flow through the turbine, until eventually there would be more power at the turbine shaft than at the



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crankshaft. At that point, it becomes logical to take the power from the exhaust turbine, and to leave the piston engine and its supercharger to function as a mere gas-producing unit serving the turbine's needs. However, the piston engine is not very efficient as a gas-producer, and logic further demands that it be replaced by something better. In sum, when you tack a supercharger onto a piston engine, you are well on the way toward inventing the gas turbine!

Wait. It has been done already. What is more, the previous uses of gas turbines have revealed a powerplant quite unsuitable for motorcycle propulsion. However, the point here is not to prove that the turbocharger is unsuitable for a motorcycle engine. The deeper truth is that a motorcycle, if it is to remain what we have always thought it to be, is an unsuitable vehicle for advanced or extreme development.

Where in a motorcycle do you find room for the compressor and turbine, for the shafts, couplings and manifolds they will require, for all the heat-exchangers and other apparatus that must be piled on if efficiency is what you really seek? Only by doing what the manufacturers have done for the past 15 years: by making motorcycles bigger, bulkier, and heavier, as well as more powerful.

So the tires have to be made bigger, if they are not to succumb to the gross overstressing from heavier weight on them, stronger tractive effort through them, and ever-higher speeds around them. There are many good reasons why those tires should not be enlarged in diameter; therefore they must be increased in width. As this process continues, the lateral migration of their centers of pressure as they tilt through corners is also increased, eventually imposing a cornering limit on the machine.

The loss of cornering power could not be accepted as progress, but there are ways of getting around that problem. If the rider shifts his body weight to the inside, the angle of bank could be reduced for a given cornering rate. This is done extensively by racing men and their imitators, and has been since John Surtees reinvented what Freddie Dixon demonstrated a generation earlier. What it proves is that tires can generate cornering power by developing slip angles instead of camber angles. To do it well, though, they need to be wider, flatter-crowned and more squat, which means that cambering or tilting must be not merely reduced but actually avoided. Shifting weight to the inside provides the clue to the ensuing logic: The thing to do is to provide another set of wheels in parallel to the first, and carry the heavy masses centrally in the bridging structure connecting the two sets. Thus, whether cornering right or left, the center of gravity would always be inboard of the set of tires bearing the brunt of the cornering forces. The rider could be seated on that central structure, too, where there would be room to redistribute components so as to lower not only the center of gravity but the overall height. Indeed, it would be quite feasible to include an enveloping fairing, which could not only carry a passenger, but contain luggage as well. Development of this idea by logical steps could result in a low, comfortable, easily cleaned and naturally stable vehicle capable of cornering rates, braking, speed, range and engine enlargement beyond the possibilities of the single-track motorcycle. Is that what you want?

Oh, you want a two-wheeler, but it must be a *high-tech* two-wheeler? Then let the notion beyond that nauseating neologism be applied to something other than brain-draining engines. Let us see some real aerodynamic advances, unsullied by stylists; let us have modern materials reduce the weight, stiffen the structure and lengthen the life of every part. Let us have radial-ply tires that need no suspension compliance, and stands that need no muscle. When all that has been done, we might again consider the turbocharger, only to find that it has been proved unnecessary. That is logic that I could happily pursue.

—L.J.K. Setright

Thompson at Large

The Right Stuff for Summer

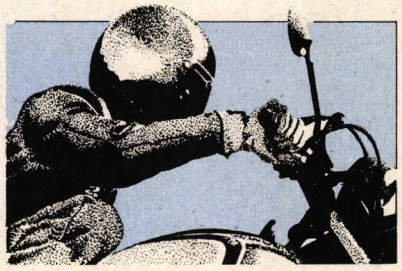
Don't wait for Japan, England or Germany to provide it.

• I figure the guy who's going to solve the problem lives somewhere in Pennsylvania, maybe near Pittsburgh. It won't be solved by some fast-talking merchandiser from Gotham, or a Malibu hipster awash in gold chains. The kind of man who's going to deliver us from the anvil of summer won't drive a Porsche to fern bars where the talk centers on direct mail sales, sexual impotence and the latest cordless telephone. He'll probably drive a van when he uses four wheels. He'll be about 50, maybe, thoughtful, a long-time motorcyclist who's avoided knee-jerk prejudices in the buying of his bikes, and who's been devastated by the grinding down of the local economy.

One day, after a particularly long ride, he'll peel off his sweat-soaked riding gear, toss it in a corner and just stare at it for a while, thinking. He'll remember all the miserable rides he's had in the summer, when the heat's like a smothering blanket and the glare turns a turnpike into a shimmering mirage. He'll remember the endless thunderstorms that tease with the promise of cooling deluges, then simply squat on the horizon like spreading atmospheric cancers. He'll remember that he never managed to outguess the storms, that when he pulled off to zip on his stifling rubber rainsuit, it *never* rained. And that when he gambled and rode ahead—the suit neatly stowed in his saddlebag—the storms sneaked up behind him and lashed him with fat waterbombs the size of his fists.

He'll think about all that one day, about how none of his friends has ever solved the problems of summer riding, about how fed up he is with the life he leads working for someone else, and he'll drag out a pad and pencil. On it, he'll list the characteristics of the problem, and then the design parameters of the solution, parameters arrived at not by formal education but by exposure. Engrossed in the process, he'll miss dinner. By nightfall, he'll be to the sketching phase. By midnight, when his wife reminds him that he has to be up early for work the next day, he'll be staring into the middle distance.

A week will pass, I figure, then two. He'll use it doing his homework. He won't have said a word to anybody—he's not a man who speaks quickly or



© 1984 ERIC GUSTAVSON

lightly—but he will have been gently probing to find out the dimensions of the problem. He'll discover that the friend who quit riding years back did so partly because his wife just got tired of being either sweat-soaked when she rode with her expensive leather jacket or, when the heat got too bad, naked to harm without it. He'll have pored through motorcycle magazine ads and product evaluations of riding gear, and will have visited all the local dealers to see and feel the goods on sale. After two weeks of low-key but constant effort, the man will know the market.

He'll know that in spite of technological breakthroughs in motorcycles themselves, motorcycle riding gear remains low-tech. He'll have divided the jackets and suits into two categories—natural materials and synthetic—and will have doggedly cataloged the products in each one by intent, style and content. He'll realize one night that the aftermarket manufacturers have covered the cold-weather problem pretty well—thanks to the snowmobile spin-off, anyway—and that racing yachtsmen have provided us the best in rainsuits. He'll have seen that leather retains its allure for riders in moderate conditions, and that the "safety suits" of synthetic material from Europe account for very little of the market despite their enthusiastic reception from the motorcycle magazines based in Southern California. Slowly, as he digests the vast stack of raw data, he'll come to understand why so many riders east of the Rockies wear nothing but short-sleeved shirts from May to late September; they have little real choice. At least, not if they want to enjoy their rides.

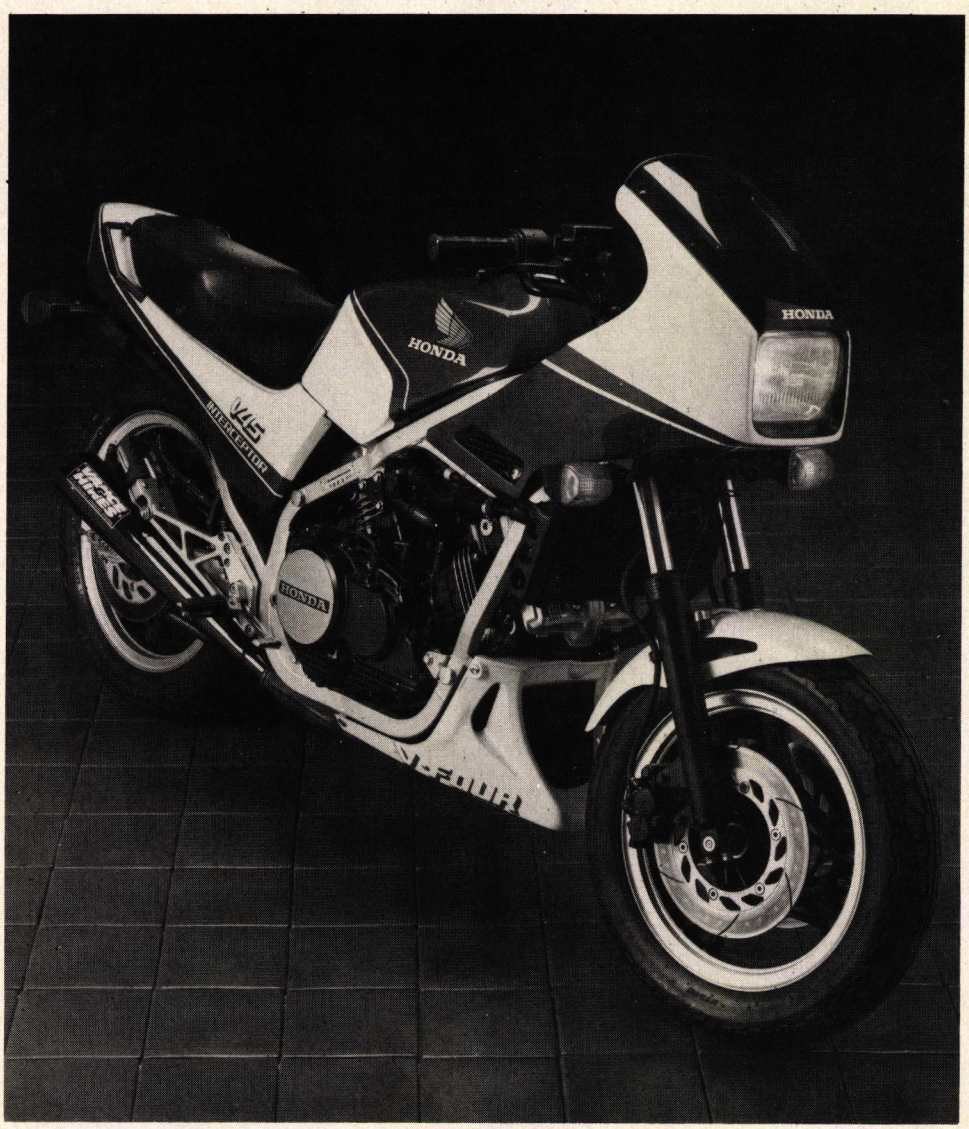
By the third week, I think, the guy'll be ready to talk to some experts. He'll phone a man like Mike Rose of Roadman in New York. He and Mike will talk about Mike's experiences at Bates Leathers, where together with Ray Hiatt he explored the frontiers of what leather could be made to do in riding gear. Then he'll call Allan Anderson at Yankee Silicones in Schenectady, New York, and talk about safety suits. Another call will go to Bavarian Cycle Works in San Francisco, a wholesale/retail outlet that specializes in sending buyers to prowl Europe for the latest in equipage.

And more calls will follow. With each one, he'll realize that his original hunch was correct: No one is building a line of riding apparel to suit the riding environment of a steamy, thunderstorm-threatened American summer. Butterflies will flutter in his gut as he considers the possibility that there really is a hole in the market, one that motorcyclists have simply grown accustomed to and thus have not protested. As he finally allows himself to consider a business plan for beginnning to fill the hole with jackets and suits that work in the summer—that both protect and breathe, that free the rider from having to gamble with tricky thunderstorms—the butterflies will get wilder. But as he goes to work each day and confronts the slumping economy, the endless chain of days spent working for someone else's profit, the butterflies will settle, and he'll stop, one day, at the local commercial bank.

He'll get out of his immaculate van, the neatly typed business plan in his hand, and keep his appointment with a bank officer who knows him, and knows he's not the flaky kind. The bank officer won't be a motorcyclist—few are—but he'll understand unserviced markets and venture capitalism. Because times are tough, he'll be skeptical at first, but as the man from near Pittsburgh methodically details his start-up plan, the banker will see the benefits to the badly depressed local economy. By the end of the interview, the banker won't have committed himself—none ever do, at first—but he'll almost be sold. What will ultimately sell him lies on the other side of his tinted glass door, for while the bank officer might not understand the needs of motorcyclists, he certainly understands summer.

I hope so, anyway. Because if the guy from Pennsylvania isn't going to sell me the stuff I need for summer survival, who is? —*Steven L. Thompson*

Performance with Style



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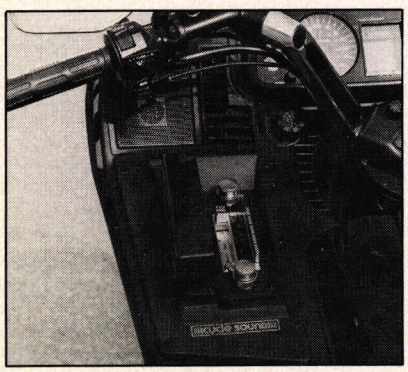
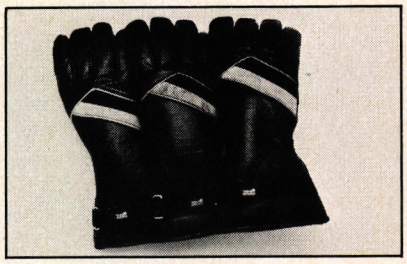
Tour Tunes: Venture owners who'd rather listen to something other than the Yamaha's vee-four might be interested in a Cycle Sound System from Hoese Corporation. Each sound system includes a Clarion AM/FM radio with cassette player, 40-watt amplifier, recessed mounting plate, antenna, radio cover and two 5-inch speakers. There is a choice of three AM/FM radio/cassette units, with prices ranging from $343 to $443, for a complete system. The sound systems are available from Hoese Corporation, Dept. CG, P.O. Box 41, Bulverde, Texas 78163.



Norton Boots? No, but Manx boots are imported from Europe. These injection-molded PVC boots are claimed to be completely waterproof, as well as gas- and oil-resistant. Manx boots have a synthetic fur lining, and feature a heavy-duty lug sole, extra instep protection and a high-luster black finish. The boots are available in full sizes only, 7–12, with a suggested retail price of $42.50. They are available from IB CO International, Dept. CG, 5446 Oceanus Dr., Huntington Beach, California 92649.

Exhaust-Driven Helmets? Well, not really, but the TURBOtx helmet does promise to keep you from being a hothead, at least. This hand-laminated fiberglass helmet features a fresh-air ventilation system that the manufacturer claims keeps the inside temperature at a comfortable level. The helmet also features a formed Lexan faceshield, and it's available in six colors: Onyx, Glacier White, Cidre Red, Charcoal, Neon Red and Neptune Blue. The helmet has a suggested retail price of $179.95, and is available in XS, S, M, L, XL and XXL. For more information, contact American Sports Company Inc., Dept. CG, 2970 E. Maria St., Compton, California 90221.



Is That Long Winter, Or Long Gloves? Winter riding is no fun with cold phalanges, so if you'd like to keep your fingers warm, take a look at Tour Master's Long Winter Gloves. The backs of these leather gloves are filled with 3M Thinsulate insulation, with a lighter, fiberfill insulation in the palm. The gauntlet features a Velcro-secured strap, and the backs of the gloves have chamois inserts to allow the rider to wipe his goggles or faceshield. The gloves are black with grey/black suede accents and red, blue or gray piping, and are available in XS, S, M, L and XL sizes. Suggested retail price for the gloves is $37.95. For more information, contact Tour Master, Dept. CG, 2115 Colorado Ave., Santa Monica, California 90404.

English Translation: The all-American-look black leather jacket, complete with zippers and studs, is now being imported from England by G-MAC. The Mach 3 Patrol Jacket features a zip-up, cross-over-style front and heavy-duty zippers on the pockets and cuffs. The waist also has a belt-type buckle adjustment. The jacket is available in sizes 34–46, and has a suggested retail price of $129.95. For more information on G-MAC products, contact G-MAC Sales U.S.A., Dept. CG, 7034 Winnetka Ave., Canoga Park, California 91306

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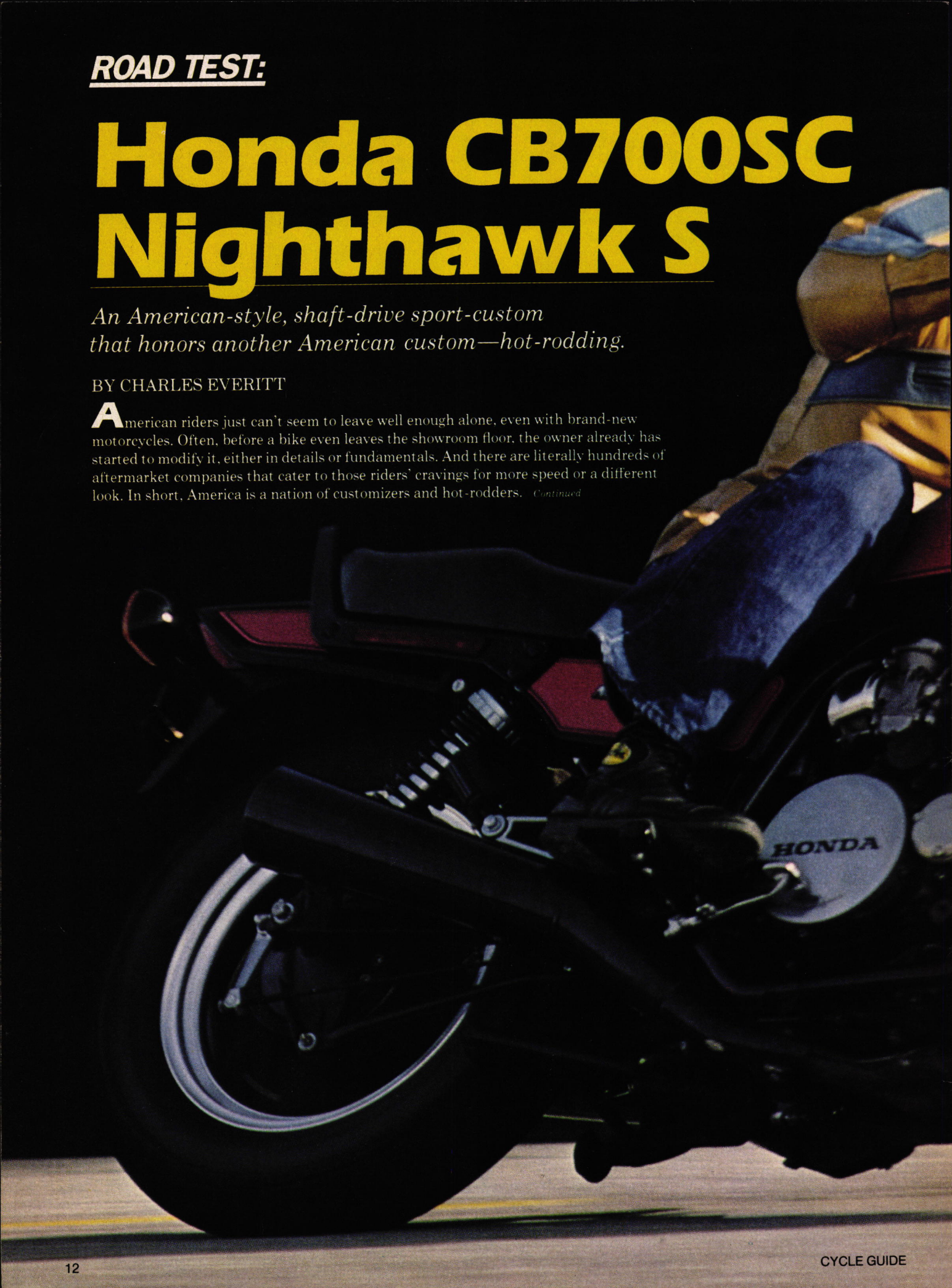
ROAD TEST:

Honda CB700SC Nighthawk S

An American-style, shaft-drive sport-custom that honors another American custom—hot-rodding.

BY CHARLES EVERITT

American riders just can't seem to leave well enough alone, even with brand-new motorcycles. Often, before a bike even leaves the showroom floor, the owner already has started to modify it, either in details or fundamentals. And there are literally hundreds of aftermarket companies that cater to those riders' cravings for more speed or a different look. In short, America is a nation of customizers and hot-rodders. *Continued*

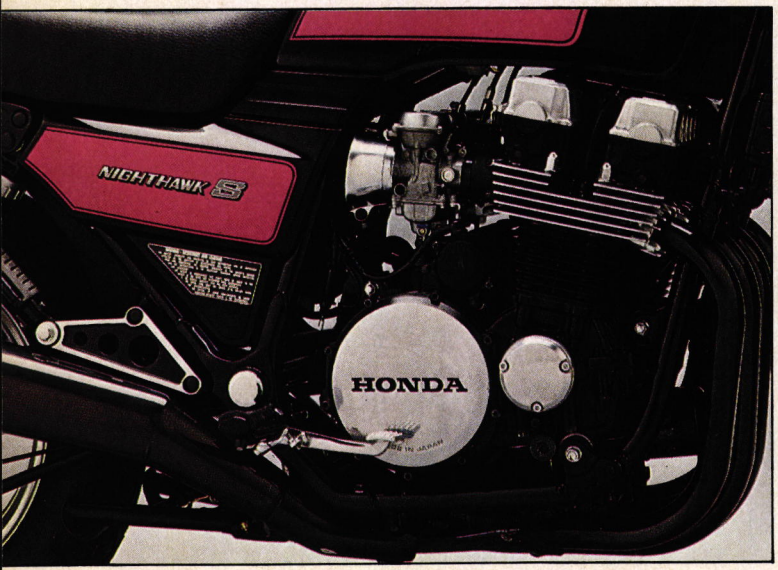


HONDA

Honda's latest response to that particularly American ethic is the CB700SC Nighthawk S, a shaft-drive motorcycle designed from the start not only to look like an owner-customized one-off sporting special, but to perform like one, too. The Nighthawk S has a high-winding transverse-four engine that packs a real top-end wallop, from 8000 rpm to right on past its 10,750-rpm redline. Furthermore, the Nighthawk S handles exceptionally well, and not just for a shaft-drive bike, either. And complementing the Nighthawk's impressive performance are low/no-maintenance features, such as hydraulic valve-lash adjusters, an automatic cam chain tensioner and electronic ignition, along with such serious sporting trappings as a quarter-fairing, a 16-inch front wheel, an oil cooler and a free-breathing exhaust system.

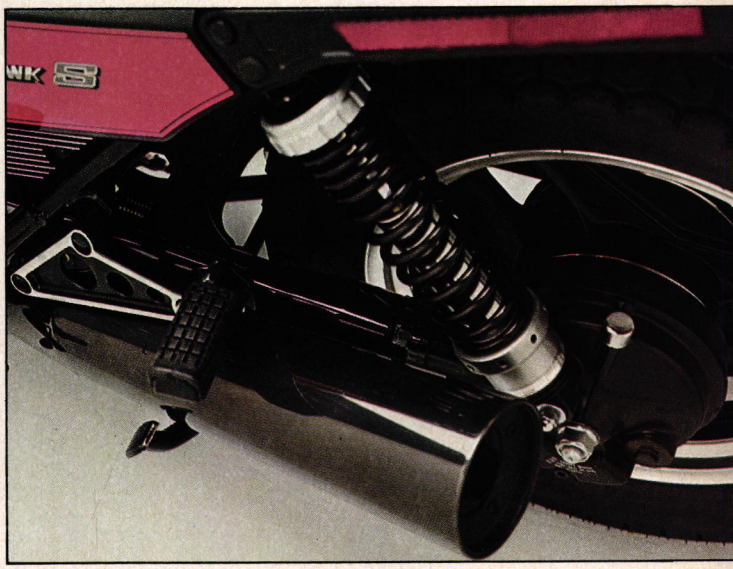
But don't think those concessions to the sporting life merely disguise last year's CB650SC Nighthawk. First off, the 650 is almost equal parts sport and custom, a high-performance boulevardier's motorcycle. The 700, on the other hand, assumes a far more aggressive sporting stance. In addition, the 700 doesn't take the traditional hot-rod approach of modifying an existing model; instead, the S is an entirely new motorcycle, and yet another execution of the Nighthawk concept. (See "Playing the Nighthawk Name Game," page 16.)

A perfect example of the difference between the two is the 700's frame design, which also contributes to the 700's cornering competence. Where the 650's frame uses a round-section backbone tube, the 700 has a massive box-section backbone, 75mm wide and 45mm high.



Engine shares design features with other Nighthawks

But, as per usual Honda practice, the pieces are all-new.



Soul-stirring sounds emit from the Nighthawk's exhaust pipes

And extra-long swingarm reduces shaft-induced jacking.

Honda claims the rectangular backbone provides better torsional rigidity, but because round tubing is stronger torsionally, any added rigidity in the frame is probably due more to the tube's sheer size than to its shape. Whatever the cause, the frame is plenty strong.

And of course the Nighthawk S has a 16-inch front wheel, an almost obligatory sportbike feature these days. But there were added benefits besides the quick steering response that 16-inchers usually provide. For example, the wheel's diameter, plus the 700's cylinder inclination (13 degrees closer to vertical than the 650's) allowed the engine to be placed forward in the frame for advantageous weight distribution. In turn, the engine placement and steeper cylinder inclination allowed a swingarm 43mm longer than the 650's. The longer swingarm helps reduce the chassis-jacking that plagues some shaft-drive motorcycles, though not—at least to any great extent—the 650 Nighthawk. The powerplant's location also permitted the Nighthawk S's engine designers to arrange the transmission shafts along the center cases' horizontal split line to simplify manufacturing and assembly; the 650's transmission shafts were staggered.

Honda's engineers also wanted the S's engine positioned low in the frame for a low center of gravity. That took a bit more work, however, and forced a change from the 650's oiling system. To start with, the CB700 has a shallower oil pan than the 650's, providing two distinct advantages. The shallower pan takes 34mm off the bottom of the engine, compared to the 650, which allowed the motor to be mounted lower in the frame, and placed the S's crankshaft centerline 25mm closer to the ground than the 650's. Plus, the oil level in the 700's sump is lower, thereby reducing the power-robbing drag caused by the crankshaft churning through the oil supply. To compensate for the lost oil capacity, the S stores lubricant in the frame's front downtubes.

The 650 and 700 Nighthawks are entirely different motorcycles for separate tasks, though, and the two also differ in spring and damping rates. Not only is the S's inline-axle fork made by Kayaba instead of the 650's Showa-made leading-axle unit, but it has a redesigned TRAC anti-dive system that can be adjusted without tools. The S's anti-dive uses the same principle as other TRAC units: Under braking, the left front caliper pivots to close off a valve and restrict compression damping. But on the 700, the caliper works directly on the valve instead of through a linkage, as on the 650. Unfortunately, the CB700's TRAC doesn't work as well as those on other TRAC-equipped Hondas we've ridden. Granted, the fork doesn't bottom and upset the bike when you clamp on the powerful, predictable front brakes, but the S does nosedive more than we've come to expect from recent Hondas.

Some riders might find fault with the TRAC's performance, but they'll be hard pressed to fault the S's handling. The Nighthawk S makes a splendid partner for attacking the backroads. Steering is light and accurate, but not quite as sudden as most motorcycles with 16-inch front wheels. Certainly the 16-incher and the bike's low *cg* contribute to the light feel, and the riding position helps out, too. On the S, a rider supports very little of his weight on his hands and wrists; he's not forced to hold himself up on the handlebars, so he can steer precisely. But Honda cooled the S's responsiveness somewhat by giving the bike conservative steering geometry for a sportbike: 30 degrees of steering head angle and 4.88 inches of trail. Not that the S steers slowly; the bike is easy to heel over into a corner, and responds slowly only in comparison to the slotcar-quick VF750F.

And if you're waiting for any criticism of the Nighthawk's handling because of the bike's shaft drive, you won't find it here. Even during hard-charging sprints through the canyons, the S feels stable and secure once set into a corner, and slamming the throttle shut doesn't provoke the bike to sink down on its suspension any more than doing so on a chain-drive motorcycle. On the S, a rider doesn't have to correct for shaft-related handling problems during hard cornering.

The suspension does its part to bolster the Nighthawk's cornering capabilities, as well. In fast, smooth corners, it's virtually impossible to make the S misbehave, even with the suspension set at full-soft, front and rear. Bumpy turns do cause some front-end chatter, although that's more an observation than a criticism. For a 150-pound rider, compensating for bumpier surfaces requires only jacking the shocks' preload to the second of five positions and adjusting the rebound damping to the third click (of four). Set thus, the suspension absorbs most bumps before they can upset the chassis. Heavier riders probably will need to use the shocks' fourth rebound damping setting, more preload and the maximum amount of air pressure (Honda recommends 0-6 psi) in the fork.

Most riders won't need those full-hard settings, though, not even to keep the bike from dragging its hardware through turns, because the Nighthawk has plenty of cornering clearance. The footpeg and exhaust pipe shield touch down first on the right, and the footpeg scrapes on the left, but those pieces don't drag until the rider is working the outer edges of the tires. In fact, the only real shortcoming in the Nighthawk's handling is a trace of fork flex that occurs when the bike is stuffed hard into corners. And the culprit seems to be the fork brace-cum-fender bracket, which, curiously enough, is rubber-mounted to the fork legs.

Just as the Nighthawk's designers endowed the bike with excellent handling manners, so, too, were they successful in making the engine produce large quantities of horsepower. And although creat-

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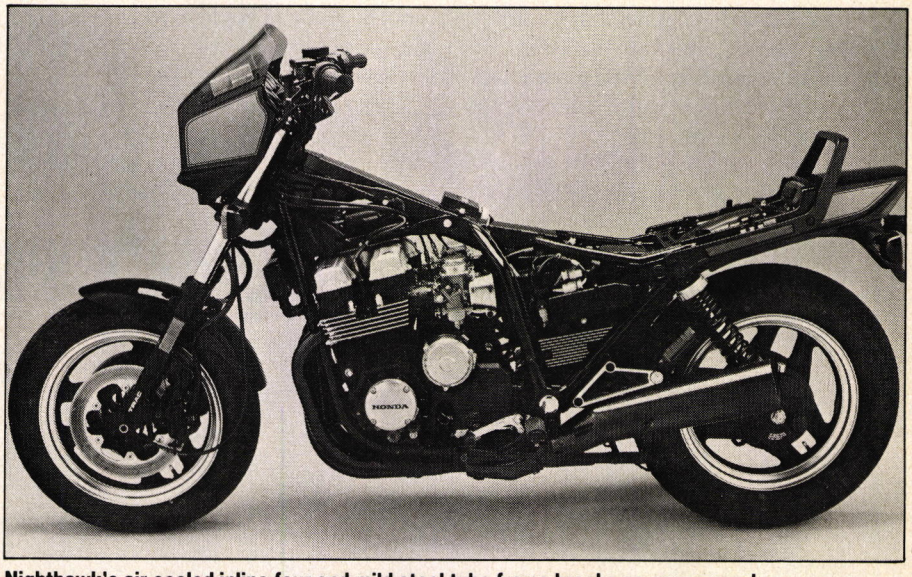

Nighthawk's air-cooled inline-four and mild-steel-tube frame breaks no new ground

The technology is conventional, but the performance certainly isn't.

ing a more muscular version of the 650's engine might have been an easier task, Honda resisted the temptation and instead built an entirely new engine that shares only the basic layout of components with the CB650SC. Each bike's engine is a rubber-mounted, air-cooled inline-four, with double overhead cams, four valves per cylinder, and a six-speed gearbox, and each has its generator mounted on top of the cases behind the cylinder block. But while the two engines share those common design features, they differ in specifics.

For example, the CB700 has much more oversquare bore and stroke dimensions than the nearly square 650, because whereas the 650 is essentially a stroked version of a 550 engine, the 700 is a destroked version of an all-new 750 sold outside of the U.S. market. Honda reduced the 750's displacement to 696.7cc to sidestep the International Trade Commission's tariff applied to motorcycles 700cc and larger imported to America. Further differences between the 650 and 700 engines include 2mm-larger intake valves and 3mm-larger exhaust valves for the Nighthawk S, along with 0.65mm more valve lift and slightly longer-duration cams, too.

As a result of those changes, and the short-stroke motor, the S's engine is peaky and simply thrives on rpm. Midrange response is a bit soft, and the motor doesn't start making serious horsepower until the revs hit 8000 rpm, when the bike starts accelerating with a vengeance. That top-end rush is so exhilarating that it makes you want to slow down so you can accelerate back up to speed again, just for the thrill of it. And although our Nighthawk S only turned a 12.04-second quarter-mile, that's due to a slippery starting line at the dragstrip more than it is to any horsepower deficiency. Indeed, in a fourth-gear roll-on contest from 60 mph with a VF750F, the Nighthawk's high-winding horsepower prevails. At that road speed, the CB700 is turning 6000 rpm and quickly pulls itself into its powerband. Let the revs drop, though, and the Nighthawk gets dusted; it just can't get through its soft midrange fast enough.

That peaky power becomes a liability when you're trying to hustle through the backroads. You must concentrate and keep the revs up to get a good drive away from corners. Keep the engine on the boil, though, and the Nighthawk will positively launch itself toward the next corner, accompanied by a full-throated howl from the four-into-two exhaust system.

With the 650 Nighthawk's engine, such sustained high-rpm running might lead to aeration of the oil and resultant collapse of the hydraulic lash adjusters.

Continued

Playing the Nighthawk Name Game

• What's in a name? Well, when it comes to Honda's use of the name "Nighthawk," not much. Because while 1984 is just the third year in which that particular nomenclature has been affixed to a few select Honda models, the Nighthawk S is the fourth different *type* of motorcycle to wear the name. Honda's other streetbikes are given names consistent with their intended purpose—Shadows are cruising customs, Magnas are performance customs, Sabres are all-purpose roadsters and Interceptors are flat-out sportbikes. But based on its name, at least, a Nighthawk's intended purpose still is up for grabs.

Not that Honda hasn't told everyone what a Nighthawk is *supposed* to be. The company coined the name back in 1982 for use on a new kind of motorcycle it had just developed: the sport-custom, a machine designed to be just as much at home out on Racer Road as it is down on Bad Dude Boulevard. And even though the first Nighthawks were more of a glued-on styling exercise than they were a built-in performance revolution, the idea of a sport-custom still seemed like a powerfully good one.

Honda proved just *how* good with last year's tremendously successful Nighthawk 650. It had The Look, the right sort of styling profile needed for patrolling urban boulevards, yet it could also tear up a twisty backroad as well as most legitimate sportbikes. Indeed, in just about every way, the Nighthawk 650 was the definitive sport-custom.

But while that 650 seemed to bring the sport-custom concept into clear focus, another 1983 model, the Nighthawk 550, muddied the picture. The 550 was not a sport-custom at all, but rather was a classic boulevard cruiser, replete with all the mock-Harley styling licks. Honda offered a number of explanations for this exception to the Nighthawk rule, but the fact remained: The 550 was inconsistent with the role the Nighthawk allegedly was designed to play.

So, too, is the role of the new Nighthawk S inconsistent, but in another way. This latest rendition of the Nighthawk theme is neither a sport-custom like the 650 nor a cruiser like the 550, but instead is a high-performance *sport* motorcycle. Honda's rationale is that any bike that has been personalized—whether through traditional custom restyling or, as on the S-model, with performance-oriented hot-rodding—has been "customized." And in the latter context, Honda explains, the Nighthawk S is as much a factory-built sport-custom as the Nighthawk 650.

Confused? Don't feel alone; so are we. Since the reason for naming motorcycles in the first place is to give them a more easily recognizable identity, it seems counterproductive to give the same name to a lot of different kinds of motorcycles. But, of course, since Honda makes these motorcycles, Honda has the right to call them whatever it wishes—just so all of us out here aren't expected to understand.

—Paul Dean

COMPARATIVE TEST DATA:

Make and Model	Quarter-Mile, sec/mph	Top Speed, mph	Weight, lbs.	Stopping Distance From 60 mph, ft.
Honda CB700SC Nighthawk S-'84	12.048/109.75	125	492	125
Honda CB650SC Nighthawk-'83	12.287/108.04	122	451	127
Honda VF750F Interceptor-'83	11.963/111.66	138	511	116
Kawasaki GPz750-'83	12.167/109.22	134†	498	136
Kawasaki KZ750-L3-'83	12.095/108.95	134†	487	132
Suzuki GS750E-'83	11.893/112.92	131†	485	135

†indicates a calculated top speed

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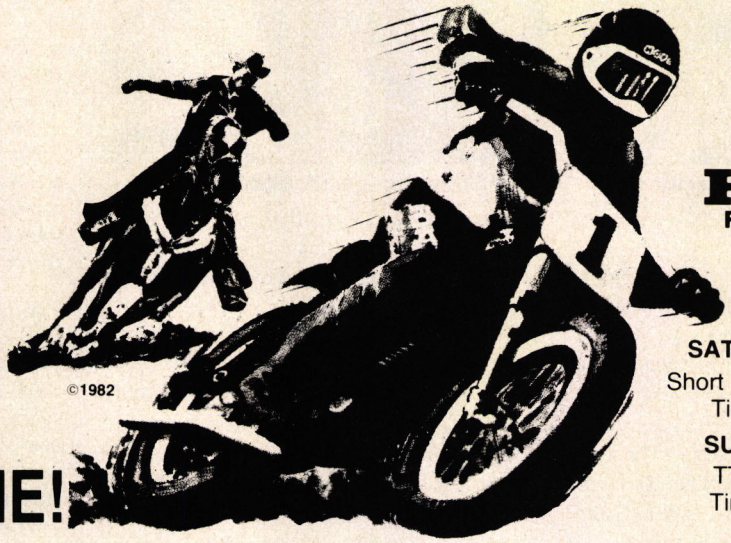

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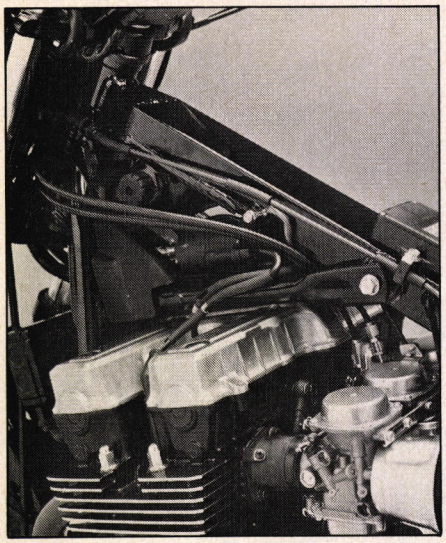
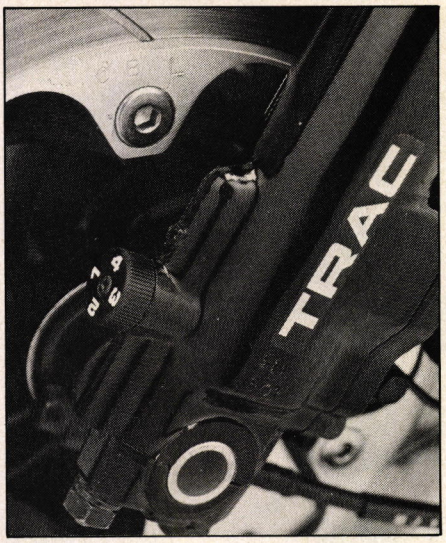


Frame uses a huge piece of box-section tube

No weak backbones here.



S's TRAC anti-dive is easily adjusted

But doesn't work as well as other TRACs.

Consequently, Honda took great pains with the CB700 to insure that the adjusters get nothing but straight oil, by employing an air-purge chamber cast into the engine cases, in the oil delivery route to the top end. In addition, the reservoirs that supply the lash adjusters in the cylinder head have 10cc more capacity than the 650's. And the system works; our Nighthawk never suffered any symptoms of lifter collapse, even during the repeated trips past the 10,750-rpm redline.

Despite the engine's rev-happy nature, it's not high-strung or snappish; the Nighthawk is perfectly happy being ridden at more sedate speeds. The 700 starts easily and warms up relatively quickly, too, and makes good low-end power, right from idle speeds. There's no need for roadracer-like clutch-slipping to make the bike pull away from a stop. And almost none of the engine's vibration makes its way to the rider. Plus, the gearbox is beyond reproach; shifting action through the short-throw lever is slick and precise.

Cruising around town or at freeway speeds also lets the Nighthawk's pilot experience the bike's compliant suspension and comfortable riding position. Set on full-soft, the suspension provides a supple ride without being mushy, and cushions the rider from most paving irregularities. Still, the shocks' initial spring rate is just a touch too stiff for touring-bike comfort. But most of what makes its way past the rear suspension gets soaked up by the saddle, which is wide, deep and soft enough for all-day comfort.

And despite the S's café racer look, the bike's ergonomics aren't extreme, and help contribute to day-long comfort, too, with a riding position surprisingly close to that of a standard motorcycle. From the saddle, it's a pleasantly short reach to the handlebars, and the footpegs are only slightly rearset. The three-piece handlebars themselves are adjustable by means of pinch-bolts, from straight-across to moderate pullback.

Comfort is not a particularly rare quality in motorcycling, and neither are arm-stretching acceleration or superb handling. It *is* rare, though, to find all three qualities in one motorcycle, especially when they come in a shaft-drive package that enhances the bike's versatility without sacrificing an ounce of sportbike ability. Even more impressive is that the Nighthawk S doesn't break any new ground—mechanically—to achieve those qualities, and instead relies on existing technology.

More important, though, is the bike's prefab hot-rod character. The CB700 has all the required accoutrements to start with, leaving the owner little to change, and the engine's high-revving top-end power makes it feel like you put in an engine kit with a radical high-lift cam, but without the attendant trouble and expense. The Nighthawk might be made in Japan, but it's a naturalized citizen of hot-rod/customized America. •

Picks:

1. Service accessibility; bolt-in frame tubes allow top-end servicing without having to pull the motor.
2. Handgrips are soft, tacky rubber, with a good pattern.
3. Well-thought-out switches on handlebars.

Nits:

1. Wildly inaccurate fuel gauge.

Ride Review

• Well, I hope you're ready, because motorcycling is on the frontier of yet another New Age. You remember when the British single and the two-stroke triple passed into history? Well, it looks like we're about to see the transverse-four fade away, too. And you need only look at the Nighthawk S to learn why.

Oh, sure, the Nighthawk is fast—faster, in fact, than any sub-750cc nonturbo. And I know the bike is as smooth as a vee-four. O.K., even the S's exhaust note is more exciting than an Interceptor's. But aside from all that, isn't it obvious that the transverse-four is just . . . well . . . *outdated*?

Maybe not. But I still hope you're ready for a new age in motorcycling, because someone better be. And *I'd* just as soon stay in the old age with bikes like the Nighthawk S. —*Ron Lawson*

• As a rider weaned on twin-cylinder motorcycles, the closest I ever got to a hot-rod was a '65 Super Hawk with Snuf-R-Nots. And although I loved the sound of a well-modified four-cylinder, I also watched with amusement the attempts of owners to get their high-strung fours to start, idle or run with anything resembling that 305's reliability. But at the same time, I never experienced the rush of a highly tuned four coming on the cam, and the adrenaline surge when the horsepower promised by that esoteric combination of cam lift, duration, port size, valve diameter and exhaust-header length suddenly came together and threatened to jerk my arms out of their sockets. Until now. No, the Nighthawk isn't blindingly fast, but it's fast enough for me. Even better, it's probably one hell of a lot more reliable than that old 305. —*Jim Miller*

• For hardcore technophiles, the Nighthawk S promises all the excitement of a term paper on 101 uses for ear wax. I mean, things like shaft drive and self-adjusting valves are terrific features, but they're nothing new, and aren't likely to get anyone's adrenaline pumping. That's why, in this era of vee-fours, turbos and fuel injection, a read through the S-model's spec sheet is a real yawn.

Still, specifications don't mean *squat* so long as a motorcycle can provide the right kind of kinesthetic exhilaration, and in that respect, the Nighthawk S is a roaring good time. In a straight line it wails like a high-revving, home-brewed dragracer, and in the corners it handles with all the aplomb of a purebred café bike—shaft drive and all. The specifications, of course, don't tell you any of that. But fortunately, motorcycles can't read. —*Paul Dean*

CYCLE GUIDE SPECIFICATIONS

Honda CB700SC Nighthawk S — street

IMPORTER: American Honda Motor Company Inc., 100 West Alondra Boulevard, Gardena, California 90247

SUGGESTED RETAIL PRICE: $3398

ENGINE

Type . . . . . four-stroke transverse vertical four
Valve arrangement . . . . . double overhead camshafts, four valves per cylinder
Bore and stroke . . . . . 67.0mm x 49.4mm
Displacement 696.7cc
Compression ratio 9.3:1
Engine redline . . . . . 10,750 rpm
Carburetion . . . . . four 31mm Keihin constant-vacuum
Air filter . . . . . disposable paper element
Lubrication . . . . . wet/dry sump
Starting system . . . . . electric only
Ignition . . . . . transistorized breakerless
Charging system . . . . . 12-volt; 280-watt alternator, voltage regulator/rectifier, 14-ampere-hour battery

DRIVETRAIN

Primary drive . . . . . straight-cut gears; 1.780:1 ratio
Clutch . . . . . wet, multi-plate
Transmission-to-driveshaft drive . . . . . spiral-bevel gears; 1.188:1 ratio
Driveshaft-to-rear-wheel drive . . . . . spiral-bevel gears; 3.400:1 ratio

Gear	Internal gear ratio	Overall gear ratio	MPH per 1000 RPM
I	2.235	16.062	4.56
II	1.545	11.104	6.59
III	1.240	8.912	8.22
IV	1.037	7.453	9.82
V	0.866	6.224	11.76
VI	0.750	5.390	13.58

SUSPENSION/WHEEL TRAVEL

Front . . . . . Kayaba air-spring, 39mm stanchion tube diameter, brake-actuated hydraulic anti-dive/5.9 in. (149mm)
Rear . . . . . dual Kayaba shocks, 4-position adjustable rebound damping, 5-position adjustable spring preload/4.8 in. (122mm)

BRAKES

Front . . . . . dual single-action hydraulic calipers, 10.5-in. (266mm) effective disc diameter
Rear . . . . . drum, single-leading shoe, rod-operated

TIRES

Front . . . . . 110/90-16 59H Bridgestone Mag Mopus G511 tubeless
Rear . . . . . 130/90-16 67H Bridgestone Mag Mopus G508 tubeless

DIMENSIONS AND CAPACITIES

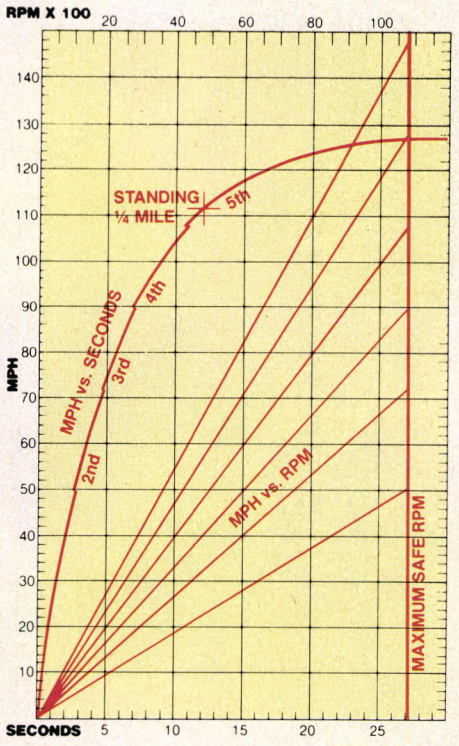
Weight . . . . . 492 lbs. (223.1kg)
Weight distribution . . . . . 48.1% front, 51.9% rear
Gross vehicle weight rating (GVWR) . . . . . 895 lbs. (406kg)
Load capacity (with full fuel tank) . . . . . 376 lbs. (171kg)
Wheelbase . . . . . 58.7 in. (1491mm)
Seat height . . . . . 31.8 in. (808mm)
Handlebar width . . . . . adjustable from 27.7 to 28.8 in. (704 to 731mm)
Footpeg height . . . . . 13.3 in. (338mm)
Ground clearance . . . . . 5.4 in. (136mm), at exhaust heat shield
Steering head angle . . . . . 30.0 degrees from vertical
Front wheel trail . . . . . 4.80 in. (122mm)
Frame . . . . . tubular mild steel, double front downtubes
Oil capacity . . . . . 2.9 qt. (2.8l)
Fuel tank . . . . . steel, 4.4 gal. (16.5l), including 0.9 gal. (3.5l) reserve
Instrumentation . . . . . speedometer, odometer, tripmeter resettable to zero, tachometer, fuel gauge, LCD gear-position indicator

PERFORMANCE

Fuel consumption range . . . . . 28 to 45 mpg (12 to 19 km/l)
Average fuel consumption . . . . . 34 mpg (14 km/l)
Cruising range, maximum . . . . . 123 to 198 miles (198 to 319km)
Cruising range, reserve only . . . . 25 to 41 miles (40 to 66km)
Speedometer error, 30 mph indicated . . . . . 28 mph actual
Speedometer error, 55 mph indicated . . . . . 52 mph actual
Best 1/4-mile acceleration . . . . . 12.048 sec., 109.75 mph (177 km/h)
Top speed (observed) . . . . . 125 mph (201 km/h)
Stopping distance from 30 mph . . . . . 31 ft. (9.4m)
Stopping distance from 60 mph . . . . . 125 ft. (38.1m)

WARRANTY: 12 months, unlimited mileage

AVAILABLE COLORS: black-and-red; black-and-blue



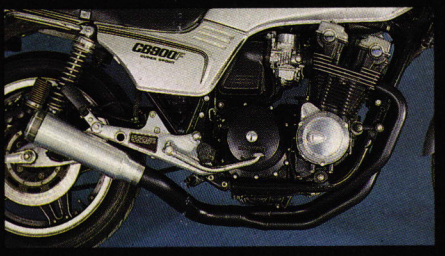
All weights and measurements are taken with machine unladen and fuel tank empty.

SUPERTRAPP

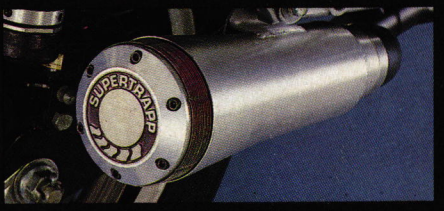
WE BUILD REPUTATIONS

SUPERTRAPP INVITES YOU TO EXPERIENCE THE RAGGED EDGE OF PERFORMANCE

SuperTrapp exhaust systems are built for one purpose—Arm stretching horsepower. Horsepower that with a twist of your wrist quickly separates the right stuff from the wrong stuff. Individually developed to test the limits of each model application. And like all SuperTrapp systems they're exhaust flow tuneable. This exclusive incremental exhaust flow adjustment feature allows each system to efficiently carburate with stock airbox and jetting or be opened up for maximum exhaust flow for heavily breathed-on motors.



SUPERTRAPP RACING SERIES*—"Factory black" racing exhaust systems that invite the ragged edge. Tucked tight for limitless cornering clearance and exhaust flow tuneable to negative backpressure, the SuperTrapp Racing Series scream performance. Tipped with an aggressive lightweight aluminum silencer on the business end. Combined with an all new aluminum end cap secured by six stainless socket-head cap screws, each system delivers performance engineering and a high tech look.



SUPERTRAPP STREET SERIES—Performance exhaust systems designed for bolt-on horsepower without compromising stock convenience features: centerstand retention, oil filter and drain access, all-mechanical silencing and no re-jetting required. Specific fit mounting brackets and extremely tight production tolerances assure effortless installation. Beautifully finished and built to stay that way. Chrome bluing is reduced or eliminated by yet another SuperTrapp exclusive—Doublewall head pipes. A thermal barrier is created between the walls reducing the temperature of the outer chrome surface. Black systems receive an electrostatically applied ceramic pigmented coating for adhesion and lasting protection.

So if you're ready to test your limits, bolt on a SuperTrapp and hang on tight.

*Available beginning February 1984.

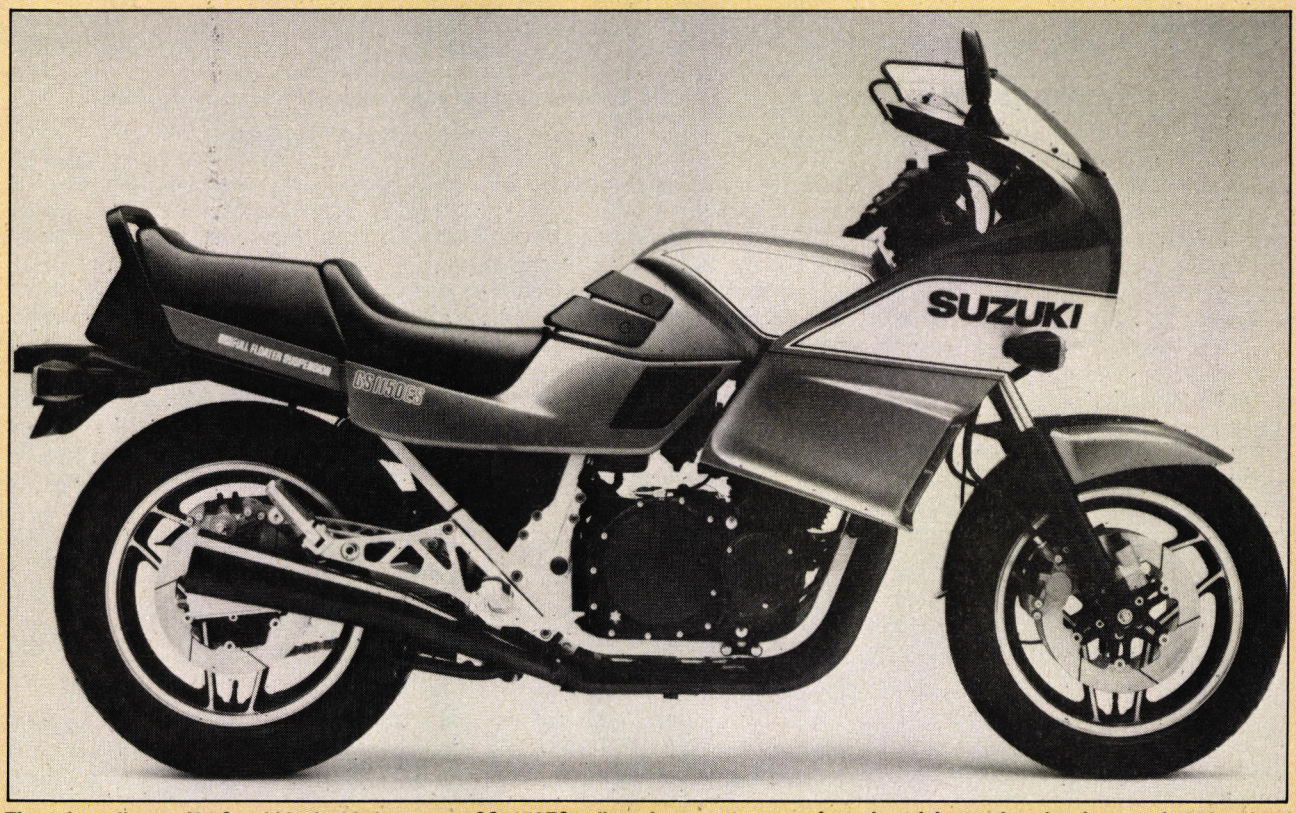
SUPERTRAPP

SuperTrapp exhaust systems are priced from $219.95 to $349.95.
To order call (916) 756-5069 or write to SuperTrapp Division Moller Corporation, 1222 Research Park Drive, Davis, California 95616.

GUIDE LINES

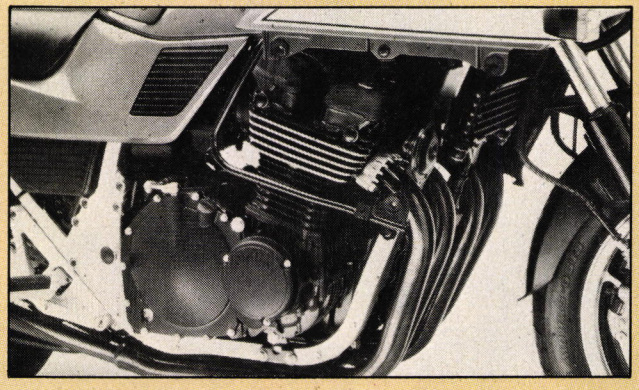
Cycle Guide's Monthly Chronicle of Scoops, Tips, Rumors and Hard Facts

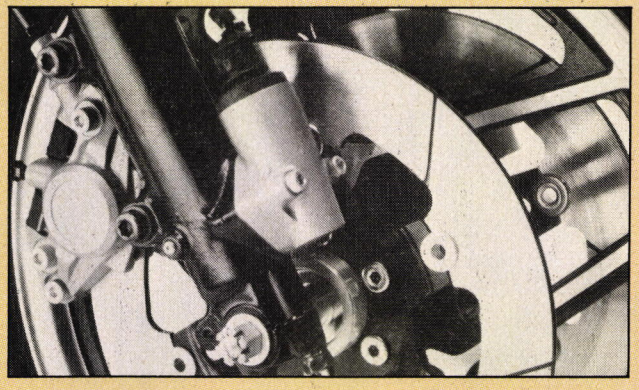
BY JOE KRESS



The only really new '84 Suzuki is the big-bore sport GS1150ES, a liter-plus canyon-carver featuring tricks employed on last year's 550 and 750

But an 1135cc engine, an all-new fork and GP-like bodywork put this bike in a class by itself.





COMING SOON

• It won't take a sleuth to pick out the star in Suzuki's 1984 streetbike lineup. There are only a few '84 models and only one of them is really new: the GS1150ES, Suzuki's top-line sport machine this year. Both to set the bike apart from the competition's 1100cc inline-fours, and to give it an extra dose of horsepower over last year's 1075cc 1100E, Suzuki's '84 flagship has had a 2mm increase in bore size, bringing the proven 16-valve powerplant up to an 1135cc displacement. And the bigger engine is mounted in an all-new chassis, with a square-tube frame, single-shock Full Floater rear suspension and an all-new fork with a 16-inch front wheel. The fork has adjustments for both preload and damping, with its damping adjustment doubling as a blow-off valve on the bike's anti-

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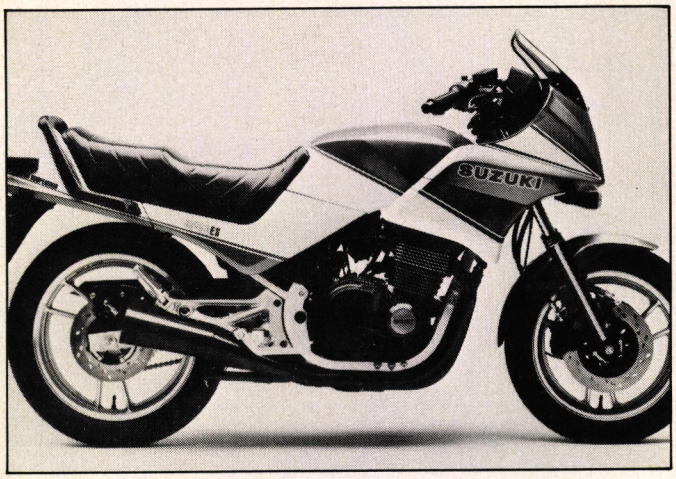
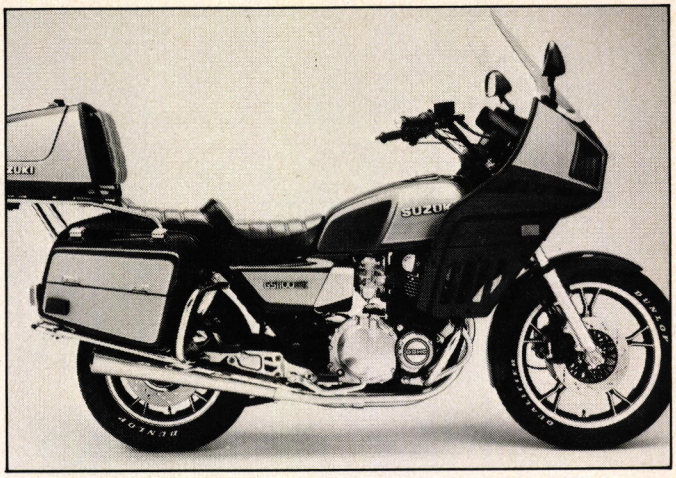


The 1984 version of Suzuki's GS550ES should look familiar

It's last year's bike with a new paint job.



Two-tone paint and a two-tone seat dress up the GS1100GK

And they're the bike's only '84 updates, too.

dive mechanism. The anti-dive differs from those used on other Suzukis, too, in that it has no external hydraulic lines. Suzuki's liter-plus sportbike is offered in one style only—the half-faired ES.

• The Suzuki middleweight lineup for '84 is the GS550ES—that's it. No other versions of the 550, no 650s, 700s or 750s are being offered. And don't waste too much time looking for new-model updates on the '84-version GS550ES, either; there are none. The 1984-model 550ES, with only paint-scheme differences, takes over right where the '83's production run left off.

• That's true for Suzuki's only other full-size streetbike for '84, too. The touring-targeted GS1100GK has only one change from its 1983 incarnation: This year the bike comes with a grey/silver paint combination and a matching two-tone seat. Other than that, this cross-country traveler is the same DOHC, eight-valve tourer introduced last year.

• Of course, those three aren't the only new Suzuki streetbikes that will be available at dealerships. Warehouses are full of unsold '82 and '83 bikes, which, obviously, explains the thin 1984 new-model line. All those non-current leftover bikes will be sold and warranteed just as if they were '84 models—although titled according to their year of manufacture—at some screaming-good deals, too. Like $1899 for a brand-new, leftover 650cc Tempter, to name just one. And Suzuki hasn't ruled out the possibility of adding new models for the U.S. later in the year, if warehouse stock comes down to manageable

And the world belongs to you. No wonder heads turn. The LTD550 is a pure-bred Kawasaki with unmatched power and style. On an LTD550 you blaze your own trail...with the engine that dominates middleweight production roadracing. The shaft-drive LTD takes 550cc beyond your expectations. The engine performs like a 650. The look

LTD

THE STREETS BELO

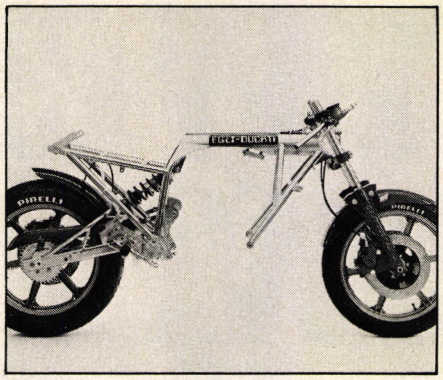
Specifications subject to change without notice. Availability may be limited. Kawasaki believes in riding safely. Check local laws before you ride. Member AMA and MSF. Ka

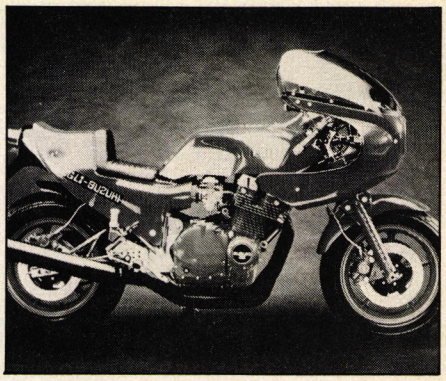
levels.

• Fritz Egli of Switzerland also has a few new models. One of them is the Red Lightning, and, like previous Egli offerings, it includes a handmade rolling chassis that can be adapted to a variety of production engines. The bike is shown here, both in finished form with a four-cylinder Suzuki engine and in the bare-frame stage, for a Ducati vee-twin. Details include a single-shock rear suspension, an Egli-manufactured fork and Lockheed drilled-disc brakes front and rear.

• Performance Research Organization, of Lebanon, New Jersey, also has a custom frame available, this one a Spondon all-aluminum unit for Yamaha TZ750s. The Spondon frame gives TZ-mounted privateers a bike that not only is 10 pounds lighter than stock, but one that also sits slightly lower than a stock TZ. The chassis also can accept an 8-inch-wide rear slick. Because the frame is designed to accept all the stock Yamaha TZ parts, the Spondon frame is claimed to be a straightforward nut-and-bolt changeover.

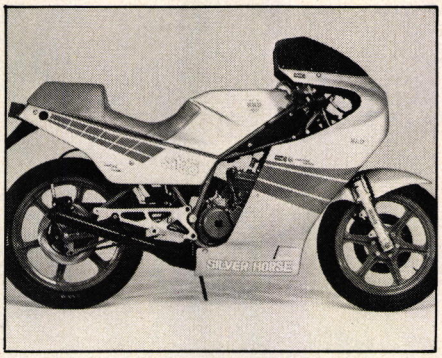
• HRD of Italy has a new bike ready, and this one is far from the company's 50cc novelty-for-children category. The SH125 Silver Horse is a pure-sport road machine, powered by a single-cylinder, two-stroke, liquid-cooled engine. Some of the big-bike features on this newest HRD include a chromoly-steel frame, single-shock rear suspension, alloy wheels and Brembo disc brakes.





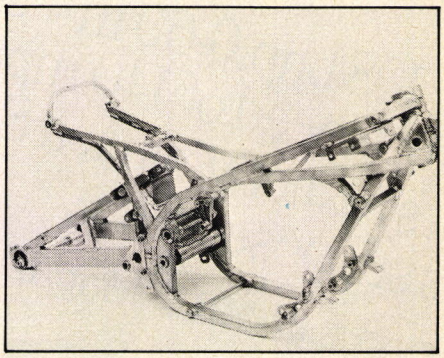
Fritz Egli knows there are riders who want a custom fit in this off-the-shelf world

And he gives them just that with his latest chassis: the Red Lightning.



HRD's Silver Horse 125 is no toy

But some will call it a baby Bimota.



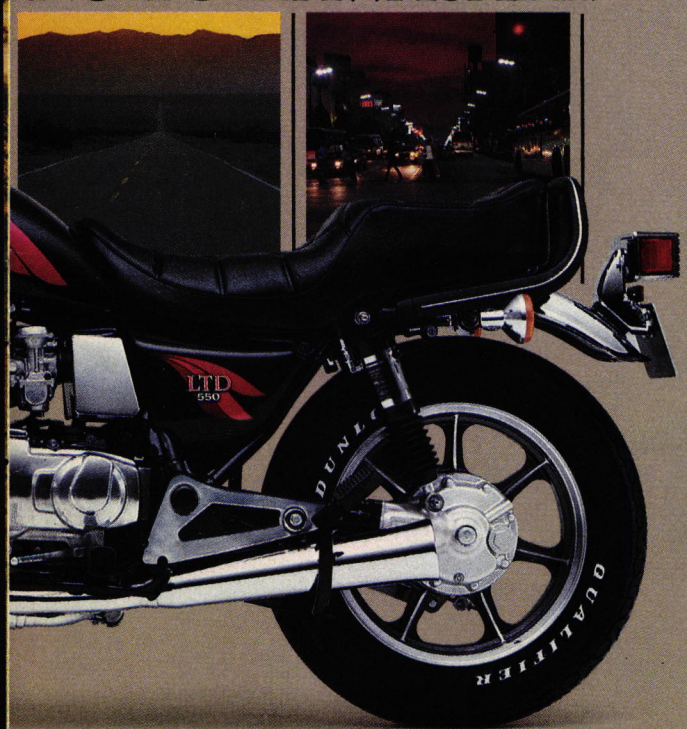
TZ racers always want a new trick

And an aluminum frame is a good one.

Continued

550 is pure big-bike. Even with a passenger and luggage this Kawasaki puts a shoulder to the wind and eats up the miles. And it keeps on running hard year after year. The LTD550. You can get more Kawasaki if you buy a 750 or 1100. But you can't get more motorcycle, regardless of size. Let the good times roll. **Kawasaki**

ONG TO KAWASAKI.



ssaki's 12 month/unlimited mileage limited warranty may be extended up to three years on major components with the Kawasaki Backup System. See your dealer for details.

HEAVYWEIGHT REVIEWS.

"...108 bhp, 0-60 in 4 seconds, a top speed of 140 mph... (it's) exactly what a Superbike is supposed to be."

CYCLE WORLD Magazine, Nov. 1983

The mighty Suzuki GS1100ED was so well received by the editors of *Cycle World*, they couldn't help calling it the Superbike of the Year for 1983. And considering the 1100's enormous power and precise handling, it's easy to see why.

In short, the bike is a knockout.

And now it's even *more* of a knockout, with a sale price that's hundreds of dollars lower than ever before. All thanks to Suzuki's Knockout Savings Sale... the one motorcycle sale that will make it easier than ever to get on a new Suzuki.

There's an entire range of Suzuki street machines on sale, which means you'll have even more chances to get a knockout price on a top-rated Suzuki.

But waiting 'till the last round isn't the smart thing to do. After all, these prices can only stay in the ring so long before it's all over.

So see your Suzuki dealer fast. The savings he's got are bound to floor you.

SUZUKI

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The Supplier of Motorcycles and All-Terrain Vehicles to the 1984 Olympic Games.

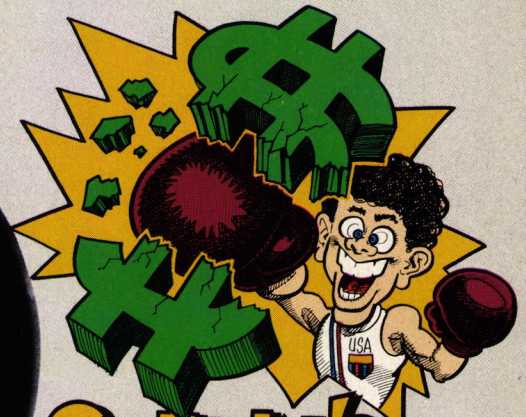
The Sensation of Suzuki.

LIGHTWEIGHT PRICES.

'83 GS1100ED NOW $3624

Suzuki's knock-out savings also apply to these as well as other selected Suzuki models.

'82 GS1100GZ	NOW $3319
'82 GS1100GLZ	NOW $3379
'82 GS850GLZ	NOW $2749



SUZUKI'S KNOCKOUT SAVINGS SALE!

Manufacturer's suggested retail price. Actual price set by dealers. Taxes, license, freight, options and other dealer charges extra. Prices may change without notice. Availability is limited.

You have 16 chances to WIN THE BIKE OF YOUR CHOICE: IN CYCLE GUIDE'S ALL NEW BIGGER AND BETTER -MORE PRIZES THAN EVER-

1984 $

CYCLE GUIDE invites you to enter this **ALL NEW 1984 SUPER $60,000 MOTORCYCLE SWEEPSTAKES.** You may be one of **TWO LUCKY GRAND PRIZE WINNERS** to drive away on the **DELUXE TOURING BIKE** of your choice.

Or maybe you'll win one of 489 other great prizes—including Hyperbikes, Motocrossers, Enduros, and Street Middleweights. With a total of 16 bikes to be given away, you have 16 chances to WIN that special motorcycle you've always wanted. **SEND YOUR ENTRY TODAY!**

And if you like, you may subscribe to CYCLE GUIDE for only 58¢ an issue. You don't have to buy a thing to enter, but you should know about CYCLE GUIDE'S LOWEST POSSIBLE RATE—

12 ISSUES FOR $6.99—HALF PRICE! YOU SAVE $6.99 OFF THE REGULAR SUBSCRIPTION PRICE, $11.01 OFF THE COVER PRICE!

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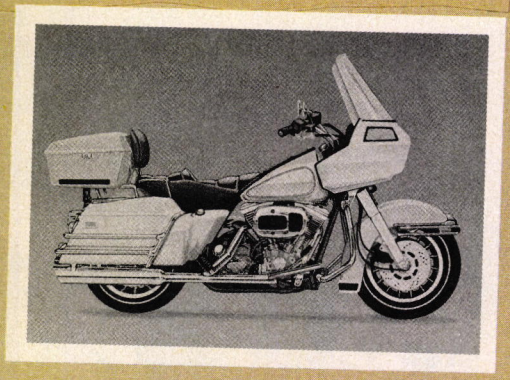
50% OFF THE REGULAR SUBSCRIPTION PRICE AND A WHOPPING 61% OFF THE COVER PRICE—ONLY 58¢ AN ISSUE

Just select the FULL-DRESS TOURING BIKE of your choice on your Official Entry Form, order CYCLE GUIDE if you wish, complete, stamp and mail today!

2 GRAND PRIZES The Full-Dress Touring Bike Of Your Choice:



***KAWASAKI 1300 VOYAGER** The unchallenged King of Cubic Stuff. Simply the biggest, most entertaining, most elaborately equipped over-the-road motorcycle ever built.

*** HARLEY-DAVIDSON FLT CLASSIC** Probably the best 2-wheeled sightseeing platform ever built. It allows you to effortlessly 'ease on down the road' in classic American style and comfort.

*** HONDA GL1200A ASPENCADE** The bike that originated 'turn-key touring' is bigger and better than ever with more power, improved handling, an all-new sound system, high-tech instrumentation and sleeker styling.

*** YAMAHA 1200 VENTURE ROYALE** It adds a dimension never before found in a full-dress touring machine: sporty back-road handling. And the awesome vee-four engine is smooth, torquey and incredibly fast.

25 THIRD PRIZES

NAVA GRAND PRIX HELMETS Nava's all-new fiberglass helmet—with crisp, racy Italian styling, colorful graphics and sleek aerodynamics. Precision computer molded fiberglass shell lined with soft brushed velour and supple padding guarantee long lasting comfort.

4 FIRST PRIZES The Hyperbike Of Your Choice:

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*** KAWASAKI GPz900R** Its all-new, 16-valve, liquid-cooled engine is 'only' a 900, but with 125 hp on tap, its performance takes a backseat to no bike of any size.

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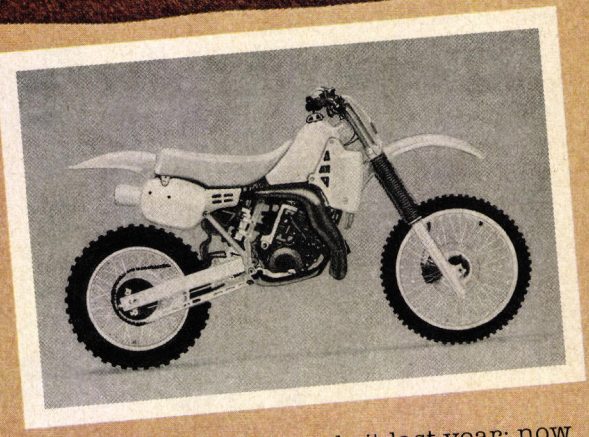

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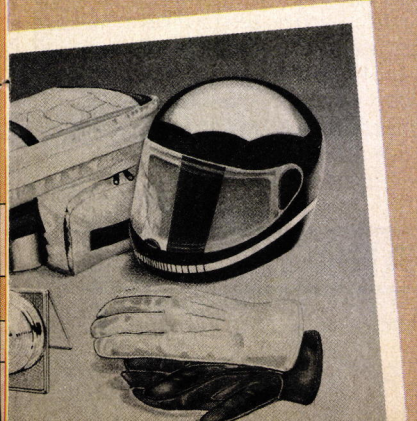

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1. NO PURCHASE NECESSARY! Use the enclosed card to enter, or print your name, address and zip code on a 3"x5" piece of paper. Mail each entry separately to CYCLE GUIDE, 1984 SUPER $60,000.00 MOTORCYCLE SWEEPSTAKES, P.O. Box 944, Farmingdale, NY 11737.

2. All prizes will be awarded in a drawing to be held under the supervision of an independent Certified Public Accountant before August 12, 1984. Decisions of the Judges are final. Winners will be notified by mail within 30 days of Drawing.

3. All entries must be postmarked by June 29, 1984 and received by July 12, 1984 to be eligible for Drawing.

4. You may win one of a total of 491 prizes—2 Grand Prizes, 4 First Prizes, 10 Second Prizes, 25 Third Prizes, 50 Fourth Prizes, 100 Fifth Prizes, 300 Sixth Prizes. All are guaranteed to be awarded.

5. Only 1 Major Prize per household. Prizes based upon availability at participating dealer. Substitution upon mutual agreement of prize winner and participating dealer for motorcycle of equal value. Sales tax is the sole responsibility of prizewinner.

6. **CYCLE GUIDE'S ALL NEW 1984 SUPER $60,000 MOTORCYCLE SWEEPSTAKES** is open to Residents of the United States. All Federal, State and Local laws apply; void where prohibited. Employees of Cycle Guide Inc., their families and their respective agencies and affiliates are not eligible.

7. A partial list of prize winners will be available after September 1, 1984.

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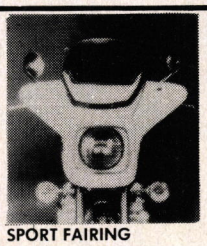

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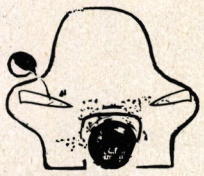

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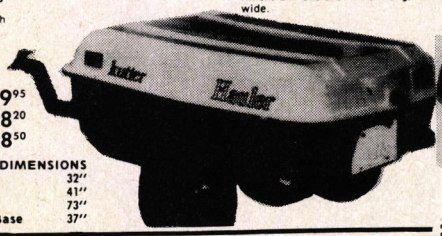

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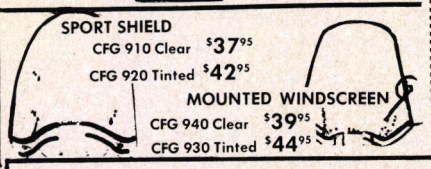

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FEDERAL CASES

• Ohio's state Highway Patrol recently polled that state's motorists about a possible reinstatement of Ohio's mandatory helmet-use law, and came up with a clear example of how survey methods can be manipulated toward a predictable conclusion. What they found was overwhelming support for the return of that statute, with 87.5 percent of those polled favoring a mandatory helmet-use law for motorcyclists. But the Highway Patrol admitted its numbers might not be an accurate reflection of the motorcycling public's true sentiment—spokesmen said the majority of those interviewed were automobile drivers, *not* motorcyclists, and would be unaffected by the law.

• Meanwhile, riders in Florida are taking that state's helmet law to court. The suit, brought by ABATE Of Florida Inc., charges that FS316.211, which requires motorcyclists to wear protective headgear while riding on public roads, is in violation of the Fourteenth Amendment to the U.S. Constitution, which provides equal protection under the law. The Constitutional question arises because only motorcyclists—not bicyclists, moped riders or automobile drivers—are required to wear helmets while using public roads.

• The Floridians have gone one step further in their fight to repeal their state's helmet-use law, however. In an effort to gain support inside the Florida state legislature, ABATE Of Florida has hired a team of professional lobbyists, noting that in the past lobbyists have had access to legislative meetings that ostensibly were closed to the public.

• In another piece of Florida motorcycle news, that state now has a requirement for a separate motorcycle-operator's license. The law, which recently went into effect, requires riders to secure the special riding permit by obtaining a driver's license, then paying an additional $1 more than the cost of that license for each year they want a motorcycle license. In addition, on October 4, 1984, the state will begin testing applicants before granting a special motorcycle-rider's license.

• The New York City Council is at it again. Following on the heels of last year's unsuccessful proposition to ban motorcycles from the city's streets during nighttime hours comes Intro 297, aimed at owners of off-road bikes. The bill, sponsored by 11 city council members, calls for the registration of all unlicensed dirtbikes, minibikes and even motorized bicycles, and also requires those two-wheelers to meet current safety and noise standards now applicable to mopeds. There's more: If Intro 297 becomes city law, owners of those bikes would have 30 days after the law's enactment to register their machines. Failure to register could result in a $100 fine—or the city's confiscation of the bike.

HARD CASH

• For the first time since 1979, the Japanese

motorcycle industry's yearly production has dropped. According to the most recent figures released by the Japanese Automobile Manufacturers Association (JAMA), total 1982 production of two-wheelers was 7.06 million units, a 4.7 percent drop from the industry's '81 numbers. However, the '81–'82 production decrease pales when compared with the slump that hit the industry in 1979. JAMA statistics show total production for that year at 4.4 million, fully 25.4 percent less than that of 1978.

• And along with the latest overall production drop is 1982's 18.1 percent fall-off in exports of Japanese motorcycles, again the first reduction the industry has experienced since 1979. JAMA reports only 3.5 million bikes left Japan during 1982, while 4.4 million were shipped the year before. As historical perspective, consider that exports for 1979 totaled 2.7 million, a 27.2 percent drop from the preceeding year.

• But while production and exports were down during 1982, Japan's motorcycle industry did post a significant gain in domestic sales. The domestic sales increased 7.3 percent, with a total 3.29 million bikes sold in the home market. Scooter sales accounted for most of the increase.

• With an estimated 14.5 million two-wheelers on the road, Japan far and away leads the world in motorcycle use. The U.S., with an estimated 7.3 million streetbikes in use, ranks second. In Japan, however, fully 80 percent of the bikes, more than 11 million of them, fall into the 50cc-and-smaller category. Machines in the 50cc-to-125cc displacement range are next in popularity for Japanese riders, with 14 percent of the domestic motorcycle buyers. Bikes displacing 250cc or more, which are closer to the American preference, account for only 3.6 percent of the Japanese home-market sales.

• Production and export reductions appear to have hit Yamaha the hardest. For the fiscal year ending April 30, 1983, Yamaha reportedly lost a total of $97 million. And with motorcycle production trimmed, the company was forced to shift some of its 17,500 employees out of the motorcycle plant and into other Yamaha divisions, and some 3,500 employees were laid off.

• Dunlop Tire and Rubber Corporation might see some layoffs too; the company is transferring all of its motorcycle tire production out of Great Britain. Sumitomo Rubber Industries of Japan, a company linked with Dunlop for almost 20 years, will be taking over Dunlop's European operations. Sumitomo, with its own technical research center in Japan, had been manufacturing Dunlop tires under license. That licensing agreement extended even to the manufacture of Dunlop's roadracing tires, some of which were used by top-line GP teams last year. Dunlop's decision to get out of motorcycle tire production in England comes as no surprise, though. The company ceased manufacturing motorcycle street tires in that country last year.

• Another British manufacturer, Girling, also announced its withdrawal from the motorcycle

Continued

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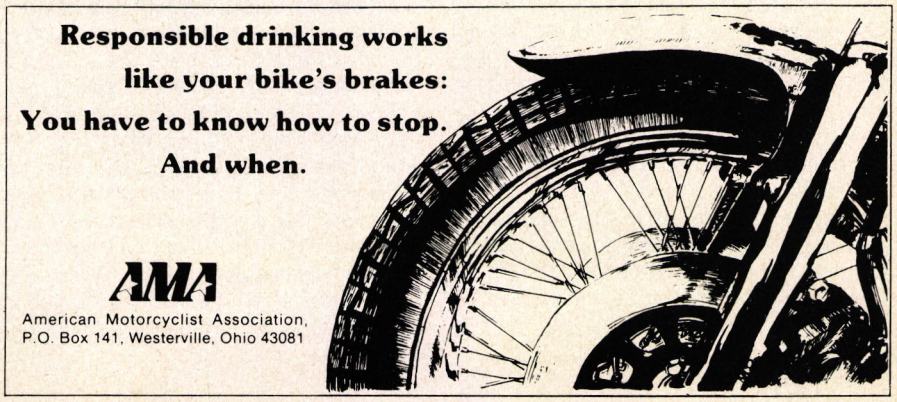
Responsible drinking works like your bike's brakes: You have to know how to stop. And when.
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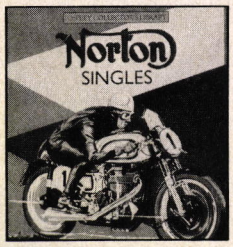
Book Review



Norton Singles
by Roy Bacon
192 pages, $19.95
Motorsport
6115 Gravois
St. Louis, Missouri 63116

• When motorcyclists' conversation turns to Norton singles, most people think only of the overhead-cam Manx, one of the most successful roadracing two-wheelers of the Forties and Fifties. But the Manx was only a single chapter in the Norton story, albeit the most glamorous. "Norton Singles," the latest title in Osprey Motorcycle Books' Collector's Library Series, goes much further, though, and devotes equal space and research to each and every Norton single ever made. And there were quite a few.

Anyone looking for a quick overview of Norton singles would be better served by a coffee-table book on the history of the British motorcycle. Bacon's book is aimed more at those interested in serious historical research, or enthusiasts who need the specifics to complete a restoration project. An old-bike fanatic collecting a garage full of Norton parts would find the lengthy appendix alone worth the cover price. Included therein are complete specification tables for every Norton single ever made (right down to carburetor-jet sizes), model-identification highlights, engine and frame numbers and a complete listing of color and trim options by model and year.

In the book's running text, each chapter is devoted to a different Norton single-cylinder model, starting with the original OHC design of the Twenties. The Manx, Norton's pushrod and side-valve singles, its wartime models, off-road singles, trials bikes, motocrossers and works roadracers each have their own chapters, each with information as detailed as in the appendix. Every change ever made, from the major to the minute, is chronicled, usually with an explanation of why the change was made and whose idea it was. Hundreds of photographs, illustrations and exploded-view parts diagrams also are included to help tell the story.

"Norton Singles" might be too much, too plodding and too laborious to hold the casual reader's interest. But for someone with boxes full of Norton-single parts to assemble, this book could be as indispensable as a set of Whitworth spanners.

—Joe Kress

market. The long-time industry supplier of brake and suspension components blamed worldwide recession, and its effects on the motorcycle industry, as the reason.

• The Motorcycle Industry Council has released its Aftermarket Retail Sales Report for the first six months of 1983, and the figures indicate that riders are keeping their bikes longer, opting to fix the old rather than buy the new. While sales of discretionary items, such as luggage racks or engine guards, were down, hard parts needed for routine maintenance experienced a sales jump. Standard replacement parts such as exhaust systems, chains and batteries all showed significant sales increases, up more than 18 percent in the case of exhausts. And while riders might not be dressing-out their bikes with accessories, that isn't true for their bodies: Apparel sales showed the largest increase of any group of aftermarket items for the reporting period, up almost 25 percent.

• Eight motorcycle officers in the Houston, Texas area have won a $43 million damage suit filed against Kawasaki Motors Corp. U.S.A. The officers claimed their police-equipment-outfitted motorcycles were defective and caused each of them to crash during high-speed chases. They testified that the bikes all went into uncontrollable wobbles during pursuit use. Kawasaki contends the officers all were inexperienced riders and the motorcycles were improperly maintained. The verdict is under appeal.

RUMORS

• Honda's now-discontinued CX-based Turbos never quite triggered the public's buying impulse, but we've heard that Honda is prepared to try again with another turbobike. Our Japanese spy network reports development work is well along on a turbocharged version of the new VF500F Interceptor, Honda's scaled-down version of last year's award-winning vee-four sportbike. More on this to come.

• Turbocharged sportbikes aren't all that Honda is working on, though. We've also heard Honda now has a four-wheel ATV planned, similar to Suzuki's popular Quadrunners. It's not certain exactly what engines will be used in the new four-wheelers, and Honda isn't talking, but the outdoor underground thinks a 250cc four-stroke single will be chosen, and the transmission will include a reverse gear.

• Even before Yamaha's RD500 is scheduled for release, there's talk of changes for that new two-stroke streetbike. We've heard those changes might be fairly extensive, too, as in two completely different versions of the bike. Latest word from our Yamaha performance-watchers says the RD500 might be available as either a pure streetbike or pure production racer, and the differences would be significant. The street version would have the standard steel-tubing frame, but the racer would come with an all-new aluminum frame, and perhaps would include magnesium engine castings, as well.

• Those high-performance spotters at Yamaha also hint the company could be going Superbike racing sooner than you might have thought. We've heard Yamaha is testing a 750cc version of the four-stroke, liquid-cooled inline-four seen at the Tokyo show, and that certain key employees involved in high-performance engine development for Yamaha have been transferred from posts in this country back to the main testing facilities in Japan.

• And when will we finally see the much-rumored Ducati vee-four, now that the company is concentrating on engine production? Latest word from Europe pegs the vee-four Ducati engine as a liquid-cooled 16-valver displacing 600cc. It should debut soon.

• The recent Ducati/Cagiva tie-up might offer some interesting new machinery, hint European sources. One of those new bikes is purported to be a 350cc vee-twin-powered sportbike with a look and style not unlike Kawasaki's GPz series, while another is said to be a 650cc vee-twin off-roader in the Paris-to-Dakar desert-racing mold.

• In more news from Italy, we've heard Bimota has a new line of chassis for Honda engines. The three Honda powerplants we've heard linked with Bimota are the vee-four 750, vee-four 500 and the inline-four 1100.

• The final bit of Italian gossip concerns Moto Guzzi. Our Eurobike watchers report Guzzi might have some changes in store for its vee-twin engines, and one all-new bike. The engine news includes four-valve heads for every Moto Guzzi 350cc-and-larger, and the new bike is said to be a pure-sport 750cc twin with four-valve heads and single-shock rear suspension. European sources say the new Moto Guzzis should be released soon.

AFTER THE FACT

• After publication of the Cagiva WMX 250 test (February, 1983 issue), we learned that our test bike's frame had been modified around the front motor mounts by the U.S. distributor, Cagiva North America. The downtubes were beefed-up just ahead of the front mounts, and our bike was fitted with two engine-to-frame attachment plates at both front mounting points, whereas the bike left the factory in Italy with just one plate per side.

These modifications were designed to prevent cracking of the motor-mount brackets, the frame and the front area of the engine cases, which is a problem some WMX 250s have experienced. Cagiva insists, however, that this modification has been incorporated into current WMX 250 models as a running change on the production line, and that our test bike was modified simply so it would be representative of the latest models.

Obviously, then, our Cagiva suffered no such cracking problems. Cagiva apologized for modifying the bike without notifying us, and assured us that the factory will accept the responsibility for the breakage of frames and engine-mount brackets on WMX 250s. The repair of any engine-case cracks, however, will

be the responsibility of the owner.

• In "CYCLE GUIDE'S Touring Collection" (December 1983 issue), we stated that Nava's FiberNava helmet was constructed of fiberglass and Kevlar. That is incorrect. The FiberNava's outer shell is 100 percent Kevlar, and there is no fiberglass whatsoever used in the construction of this particular Nava helmet.

• In the Motomart section of our November 1983 issue, we stated that the RevGuard by Kilgore Digital was claimed to be infinitely adjustable anywhere between 7000 and 10,000 rpm. That is incorrect. The upper limit of the RevGuard's adjustment range is 14,000 rpm.

• Ed Arnold, Velocette restorer, enthusiast and friend to the staff of CYCLE GUIDE magazine, died recently. Ed spent most of his life in the motorcycle industry, including time working as a factory representative for Mustang motorcycles and with Johnson Motors, the original importer of Triumph. But Arnold's main interest was Velocettes, and in recent years he was technical advisor to the Velocette Owners Club. Arnold didn't own mantlepieces; he owned motorcycles, and intended for them to be ridden. We were photographed riding his Velos in the "TT Time Machines" in our October 1982 issue. He will be missed.

APART FROM THE CROWD

• You've heard right; Suzuki is now in there with the soft-drink and candy companies, offering its support to the '84 Olympics. Suzuki is the "Official Supplier of Motorcycles and ATVs" to the '84 Los Angeles games, and has the job of schlepping the Bulgarian javelin thrower, or members of the Chinese volleyball team, to their respective events on time. No little responsibility, that.

• Though hardly matching Suzuki's Olympic coup, two Frenchmen recently did their part to put the sport of observed trials front-and-center in the public eye—if only for one shining moment. Charles Coutard and Joel Duscuns successfully completed the first-ever motorcycle ascent of the Eiffel Tower, climbing 746 steps up to the monument's second level, 378 feet above the streets of Paris. The pair's up-on-the-pegs escapade had to stop at that point, though—they ran out of stairs. Higher platforms on the tower are accessible only by elevator, and riding around in circles inside an elevator car just wouldn't be the same.

• Now suppose for a minute that trials duo didn't make it and had to call for assistance. Cagiva's new 350 Protezione Civile would be just the bike to answer that call. This little two-wheel emergency tender comes factory-equipped ready to handle distress calls, and includes medical supplies, a fire extinguisher, a radio transmitter/receiver, an ax, a shovel and even a gas-powered air compressor mounted on its tail. Okay, we'll admit the Cagiva would have one hell of a time trying to climb the Eiffel Tower; that's one rescue maybe it couldn't make. But to get first-line aid into difficult-to-reach disasters, this little

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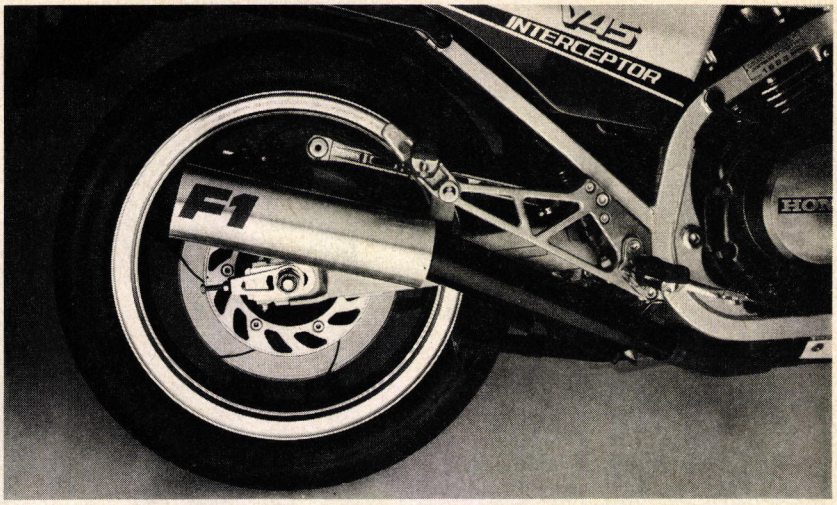

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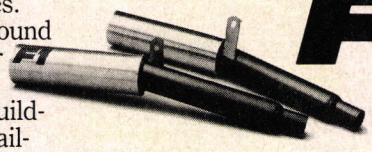

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CG-024

Last Valentine's Day Mary had a hole in her heart.

Mary is just one of 25,000 children born each year with heart defects, but open heart surgery has corrected the problem. And this Valentine's Day, for the first time in her life, she's going to be a normal kid.

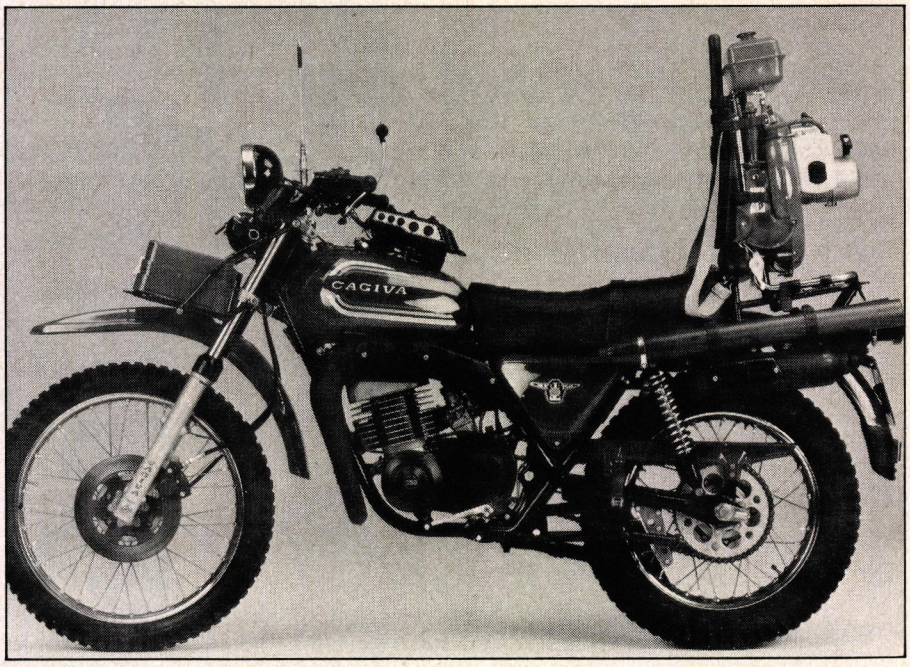
The American Heart Association is fighting to reduce early death and disability from heart disease and stroke with research, professional and public education, and community service programs.

But more needs to be done.

You can help by making this Valentine's Day "A Time To Remember." Send the Mary in your life a special occasion card from the American Heart Association, listed in your telephone directory.

American Heart Association

WE'RE FIGHTING FOR YOUR LIFE



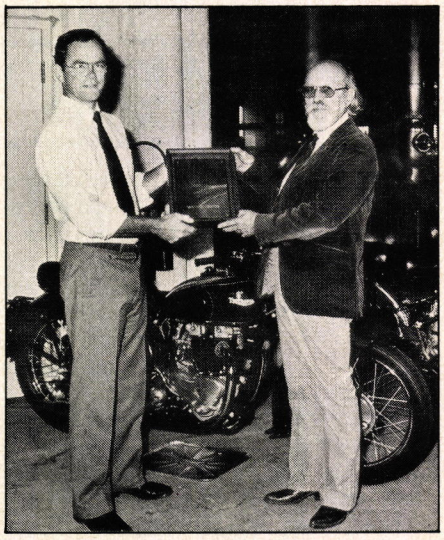
Rescue teams find some emergencies almost impossible to reach

But for those really tough ones Cagiva now offers a solution.

two-wheel Emergency 1 seems hard to beat. Cagiva is hoping a few professional rescue services see it that way, too.

• Meanwhile, 71-year-old Alan Freeman is hoping *anyone* sees it his way—he's designed a solar-powered motorcycle. Freeman's latest development (he's already built a three-wheel solar car) is a two-wheeler powered by a 96-cell solar panel working in conjunction with a 12-volt battery. The solar panel mounts on the bike's handlebar, and supplies about a quarter of the power needed to get the bike up to its 25-mph cruising speed. Now, 25 mph is hardly blood-stirring, apparently even for a 71-year-old. So Alan Freeman is busy working on that problem, experimenting with different gearing in the solarbike's five-speed transmission, and switching around drive pulleys on the bike's electric motor. Future modifications include plans for a 24-volt battery. Is this a preview of high-performance for the future?

• You can be sure there were no solar-powered bikes in Frank Conley's exhibit recently held at San Francisco's Anchor Steam Brewing Co. Conley, as president of the Classic and Antique Motorcycle Association, deals in history. And Fritz Maytag, the brewery's owner, thinks Conley deals in art, as well, which explains his support for the show. "Private industry should do more to support the arts," Maytag said. Staged amid the polished brass and copper of the old California brewhouse, Conley's invitational antique bike exhibit showcased 30 top-flight two-wheel classics, all of which were major-award winners at previous shows. Maytag believes credit for a restored classic should be equally divided between its original designer and the person who brought that classic back to life. "You just have to appreciate the artistic effort needed to restore these motorcycles," he said. That sentiment wasn't lost on Frank



CAMA's Frank Conley (right) accepts award

This one for his artistic talent.

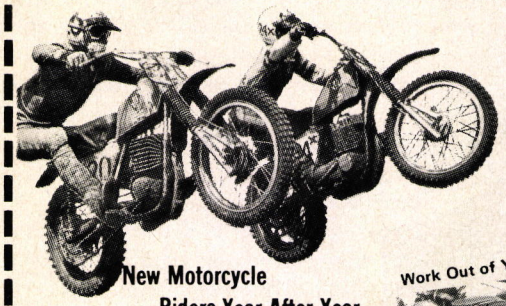
Conley who, for longer than most, has known all about the classic motorcycle as art.

• Ever wonder where the top-ranked MX stars come from? Things probably were different in the past, but for the future it looks as if they'll be double-jumping out of the ranks of BMX, bicycle motocross. Best estimates put more than 250,000 kids between the ages of 5 and 18 competing on some 700-odd tracks across the country, all honing up their berm-busting skills. But they are also fine-tuning their bank-deposit techniques. Outstanding BMX riders make between $40,000 and $75,000 a year in prize money, company contracts and contingency payouts. In fact, one of those little pedalers, 10-year-old Greg Hill from Santa Ana, California, is expected to top the $100,000 earning mark this year. Anyone for going out to the garage and dusting off that old Schwinn? •

Now YOU Can Be A MOTORCYCLE MECHANIC

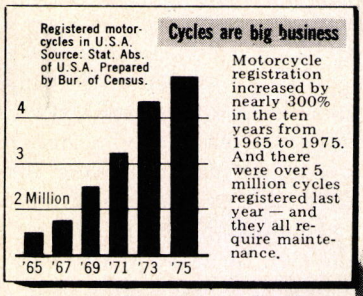
LEARN AT HOME IN SPARE TIME WITH NO PREVIOUS EXPERIENCE

Experts show you what to do, how to do it... guide you every step of the way to become a skilled motorcycle mechanic.



If you like to ride a bike for fun . . . learn how to fix it for profit! Can you imagine a better way to earn your living whether you choose to work in a cycle shop for somebody else or decide to start your own cycle repair business. Now, thanks to North American, there's a fast, easy way to get training at home in your spare time. No need to quit school or job. Experts show you step-by-step everything from minor tune-ups to major overhauls.

New Motorcycle Riders Year After Year


Registered motorcycles in U.S.A. Source: Stat. Abs. of U.S.A. Prepared by Bur. of Census.
Cycles are big business
4
3
2 Million
'65 '67 '69 '71 '73 '75
Motorcycle registration increased by nearly 300% in the ten years from 1965 to 1975. And there were over 5 million cycles registered last year — and they all require maintenance.

Work Out of Your Home

We show you how to start in spare time at home — or if you'd rather, get the knowledge you need to apply for a job working for someone else.

Wrenches, sockets, test instruments and more...

You Get Everything for a Fast Start!

Your Future is in Your Own Hands — You can decide for yourself whether you want to work for someone else or get into your own cycle repair business. Start in your spare time repairing cycles at home—or get a job with a motorcycle shop! After you've been a working mechanic, you can decide whether you want to start your own repair business.

You'll Be the Center of Attraction in Your Circle of Friends—Enjoy the admiration of friends and neighbors as they flock around to watch you tear down and tune up all kinds of motorcycles. And just think of the satisfaction in knowing you've got the best performing bike in town. Plus, you can make extra dollars fixing motorcycles for friends, neighbors.

Motorcycle Shops Employ Qualified Mechanics. Has your bike ever been out of action waiting for needed repairs? Some shops don't have enough mechanics to take care of everyone as fast as they like.

Graduation from this course does not insure that you will get a job. To find out how our graduates have done, send for our job placement record.

FIRST FOLD HERE

T11G

FIRST FOLD HERE

NO POSTAGE NECESSARY when you mail this ENTIRE Postage-Paid ad

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2. Fold page in half on 1st fold lines
3. Fold page again, on 2nd fold lines
4. Tape or glue the 3 open sides and drop in the mail box today.

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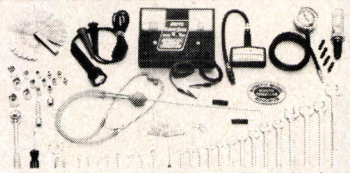
Rush FREE color brochure and full information on how I can learn Motorcycle Repair.



Special Cycle Tools and Test Instruments included to start you fast! We teach you how to use wrenches, sockets, impact screwdrivers, timing lights, compression gauges, vacuum gauges, degree wheels, wrench sets and much, much more. These are yours to use during your training . . . and yours to keep in your action packed career as a motorcycle mechanic.

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Cycles are big business . . . and so is fixing them! There are more than 5 million motorcycles registered in the U.S. today. Plus an estimated million more dirt bikes. No wonder there is work for the skilled repairman.

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RIDING IMPRESSION:

BMW K100

Call it mature, sport-touring elegance or call it the first BMW for wheelies and hanging-off. Or just call it the K100.

BY LARRY WORKS

"They don't make them like they used to" has little meaning at BMW. The firm's instantly recognizable opposed-twins have been in production since 1923, and despite numerous changes made to them since then, today's top-of-the-line R100-series Beemers have more in common with those twins of 60 years ago than they do with mainstream Japanese motorcycles.

Still, even if the hands of time seem to turn slowly at Bayerische Motoren Werke, they *do* turn; and in recent years even BMW had to admit that the 70-horsepower R100s had become decidedly long in the tooth compared to the 100-hp-plus literbikes that issue from Japanese assembly lines. Such a large performance disparity posed a major hurdle for BMW: Engineers there felt the opposed-twin could not be pumped-up to appreciably higher power levels without adversely affecting its reliability or complicating its maintenance. So BMW set out to build the K100 series, motorcycles that would not only close the performance gap with Japanese machinery but still would be distinctly BMW.

One of the results of that project is the K100RS you see here, slicing through the backroads of the South of France. And if you're prone to dismiss the first all-new motorcycle design from BMW in 60 years as some quaint Black Forest dalliance with high performance, forget it. This rakish-looking road rocket, armed with its 987cc, DOHC, liquid-cooled, fuel-injected, longitudinal, horizontal-four, is going to smash any notions about dated moto-engineering at BMW into smithereens—as well as dusting some very good Japanese literbikes in sport-tours at superlegal speeds.

Building a bike to accomplish those goals was no small task, especially since BMW wanted the K-series to avoid a direct engineering confrontation with Japanese bikes. In fact, matching current Japanese technology would have been devastating; it either would have tied BMW to a year-by-year revamp of the K100s to keep pace with ever-changing "cutthroat competition," or it could have doomed the K-bikes to immediate obsolescence. To do everything BMW wanted the K100s to do, then, the new bikes would not only have to be good—good enough to insure the support of BMW loyalists as well as the general motorcycle-buying public—they would have to be *different*.

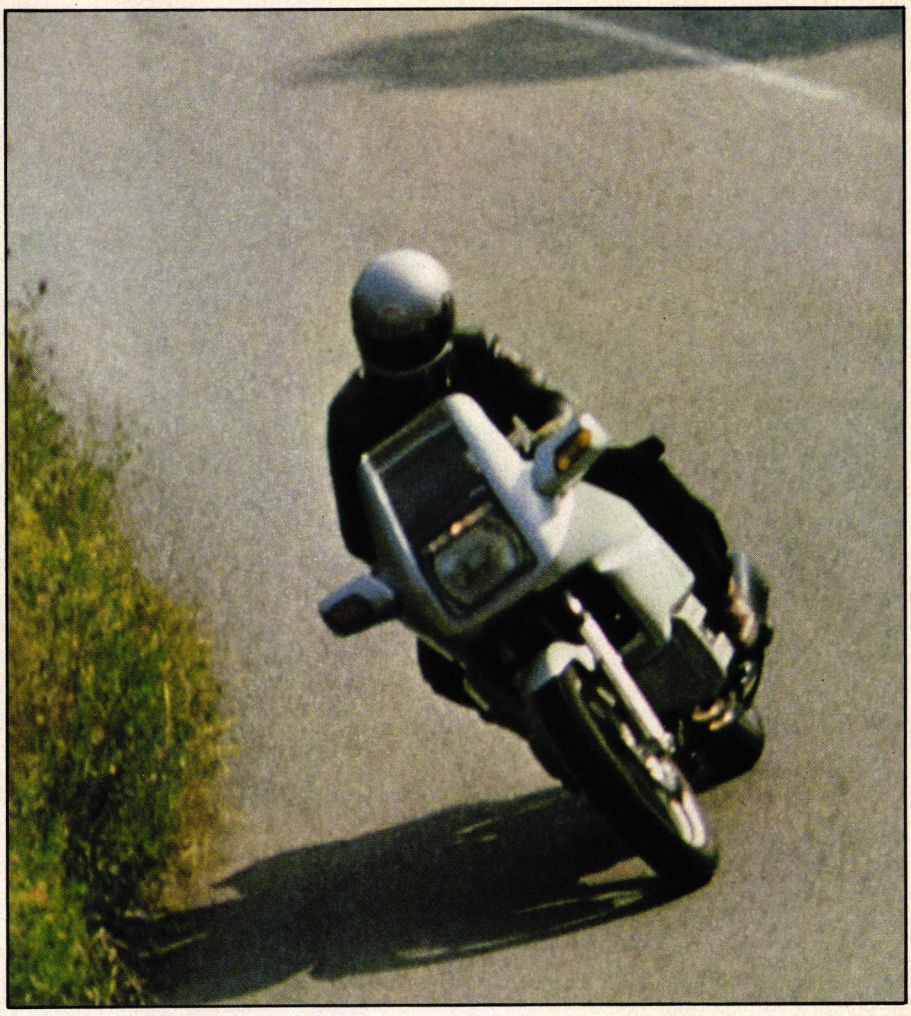
That's no short order. But based on test rides of the K100RS and the unfaired K100 (the third bike in the series, the touring-targeted K100RT, was unavailable for riding) during BMW's world press introduction in La Napoule,

PHOTOGRAPHY © STEVE ANDERSON

France, the K-series succeeds on both counts. What's different about the K-bikes is apparent: From almost any angle, the massive aluminum engine cases dominate your view. That asymmetrical lump of motor, backed up by the single-legged Monolever swingarm on the right and a stainless steel, square-mufflered, four-into-one exhaust system on the left, serve instant notice that the K-bikes are, indeed, different. They resemble nothing the Japanese have to offer.

Which was, of course, integral to BMW's plan. In developing the K100, BMW engineers considered—and rejected—various engine configurations, including the opposed-, vee- and transverse-four. They concluded that no matter how those different engine types might be executed, no matter how the bikes might be styled, the end result would be the same: an inevitable comparison with Japanese models. Finally, in 1978 the horizontal-four, with its crankshaft positioned longitudinally in the chassis, was chosen to power the K100. That configuration offered not only the potential for higher performance than the opposed-twin it would eventually supplant but the look of exclusivity vital to maintain BMW market mystique.

The longitudinal mounting of the engine affords more than simply a distinctive appearance, though. The forged steel, five-main-bearing crankshaft is on the same plane as the driveshaft, allowing a direct power transmission to the final drive without the frictional losses concomitant with bending the horsepower, if you will, through direction changes within the engine. Further, the engine's placement in the frame puts the sparkplugs, valves and fuel-injector nozzles where they can easily be reached on the left side of the engine; and removal of the crankshaft bearings, pistons and connecting rods can be accomplished through the right side, without pulling the engine out of the frame.



A longitudinally mounted engine is not, however, without disadvantages for motorcycle use. Such a configuration can make for an excessively long motorcycle, thus creating a potential handling problem. But BMW kept the K100's engine length in hand by utilizing somewhat undersquare bore/stroke dimensions (67mm by 70mm); liquid-cooling also allowed the bore centers of the cylinders to be spaced more closely than would have been advisable in an air-cooled engine. And mounting the swingarm pivot *inside* of the transmission case was another space-saving technique BMW employed with the K100. Overall, that concern for length paid off in a 59.7-inch wheelbase, which is only marginally longer than an R100's, and *shorter,* actually, than that of many other literbikes.

Length, of course, was not the only problem the engineers had to contend with. Weight is always the enemy in motorcycle design, especially when developing something as complex as a liquid-cooled, shaft-driven, multi-cylinder performance machine. But the K-bikes were kept off of the fat list through the use of expensive, lightweight materials, and by paring off weight in the original design. The K100's frame, for instance, has no downtubes and uses the engine as a stressed member; the bare frame weighs less than 25 pounds. And the decision to use only two valves per cylinder in the engine was made as much to limit overall valvetrain weight as it was to ease valve maintenance. Weight-consciousness shows up in the K100's cylinder bores, too, in the form of a nickel-silicon coating called Scanimet that was used in place of heavier, cast-iron liners. And the

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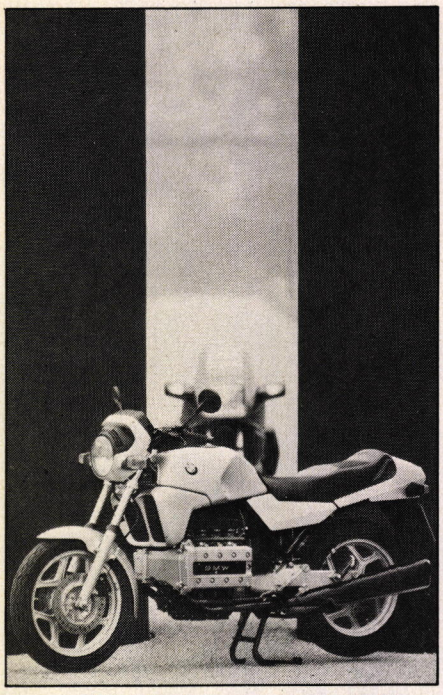
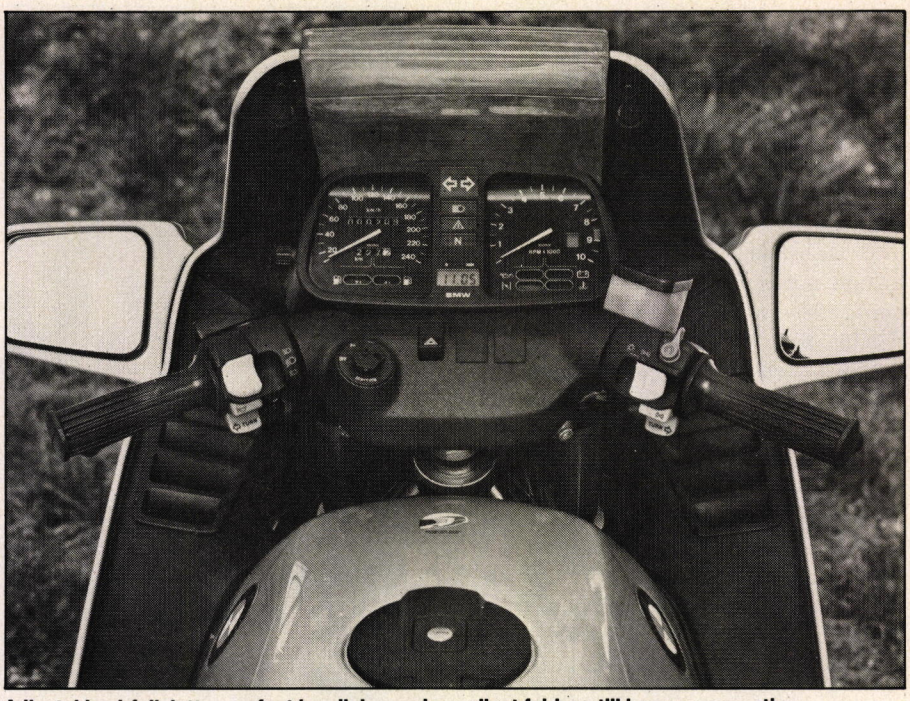


Base-model of BMW's new series, the K100

Running gear is common to all three.



Adjustable airfoil, letter-perfect handlebar and excellent fairing still leave one question:

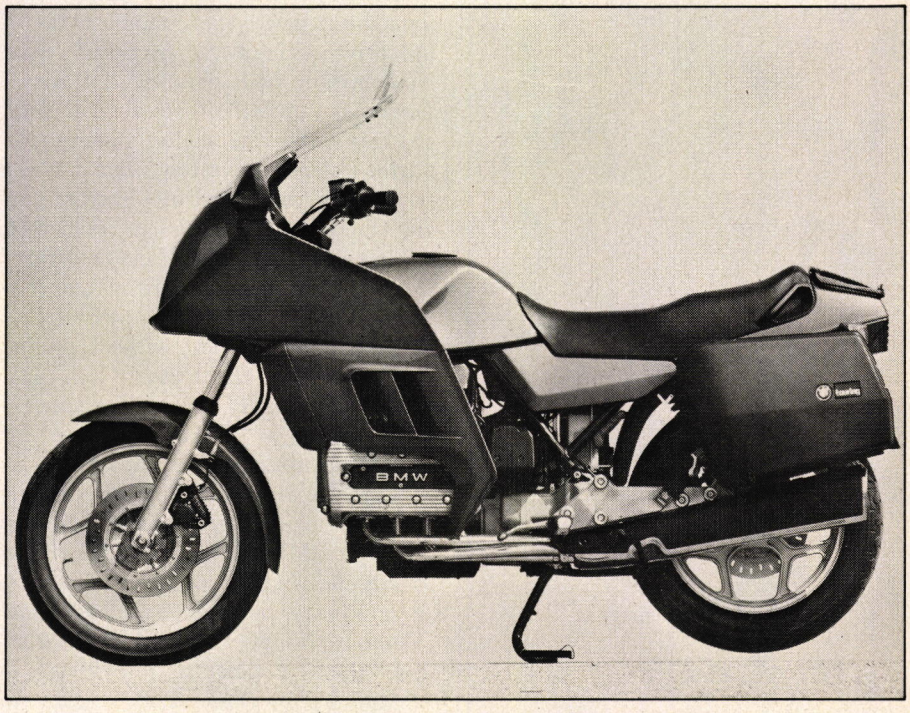
Does RS designate Racer-Sport or Right Shapes?

use of aluminum and other light alloys is integral to the construction of the K-series; alloys show up not only in the wheels, engine cases and gearbox housings, but also in the fuel tank, the Monolever swingarm, the clutch and even in the gearbox internals. All that weight-watching yielded a big motorcycle that doesn't feel heavy; the RS (with its 22-liter fuel tank filled), for instance, tips the scales at under 550 pounds.

The technology involved in designing and building the K100 is doubtless fascinating, but it can't compare with the experience of firing the thing up and riding it. In short order it becomes obvious that BMW got it right, first time. The 90 horsepower BMW claims for the motor seems always on tap; the engine pulls evenly, strongly, anywhere from 800 rpm up to its 8500-rpm redline in all five gears. There's no real powerband, almost no character to the power at all. It's simply *there,* all the time. And with that kind of muscle available, you can take your pick of short-shifting or revving the engine out—the motor displays no preference.

When you *do* shift, you find that the K-bikes are minus two long-time BMW traits. First, the clunky, long-throw shifts that BMW pilots have learned to endure are no more. This Beemer changes gears easily, smoothly and precisely. The K-bikes also lack the traditional up/down chassis-jacking that's been practically a registered trademark of BMW's twins; in this respect the K100s are fully the equal of the best Japanese shafties. But in terms of traits lost and gained, the K-series acquired something the R100 never had. There's a high-frequency tingle through the handlebar that's reminiscent of a transverse-four's vibes. Despite that small vibration, though, the K100 motor is a model of well-bred civility. Without complaint or quirks—seemingly almost without effort—it can propel the RS, the most aerodynamically efficient of the K100s, to an indicated top speed in excess of 135 mph.

And, remarkably, at such a blistering pace the RS seems quite at ease. The frame-mount fairing, with its adjustable top wing, creates a perfect rider-sized pocket of still air, while allowing an unobstructed view from over the top of the screen. And not only is the RS cockpit dimensionally right for avoiding the wind, it is right for riding. The seat/peg/



Touring fairing, saddlebags and taller handlebar differentiate RT from other K-series bikes

And the engine distinguishes all three from everything else in motorcycling.

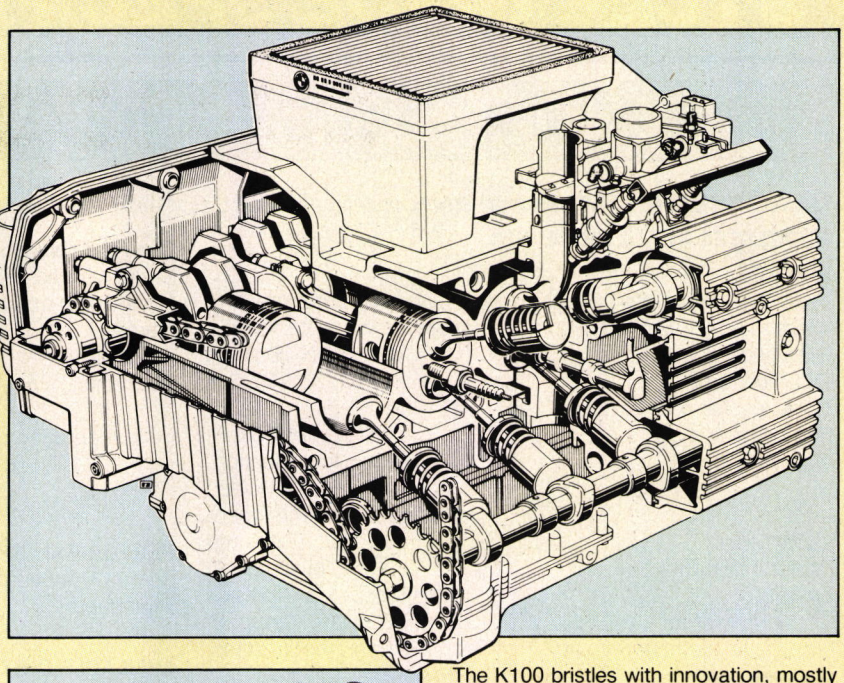
handlebar relationship seems not one millimeter off, and the half-crouched riding position strikes an ideal balance between relaxation and readiness. It shouldn't be surprising, given the autobahns, autoroutes and autostradas of Europe, that the RS is configured for speed. But what is absolutely amazing is the bike's rock-steady unflappability in flat-out running.

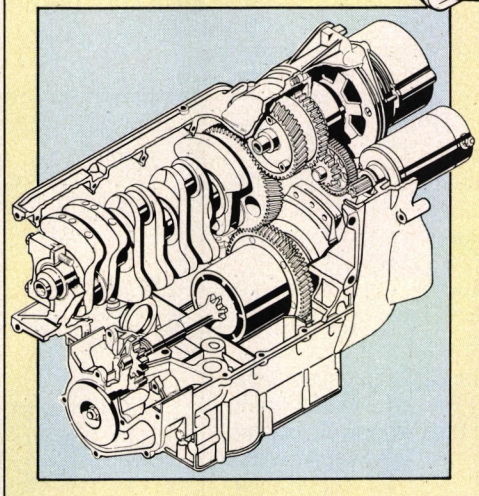
What is sheer icing on the cake, then, is that the K100s don't pay for that high-speed stability with slow steering and heavy, truculent handling. Instead, the K100s steer quickly, accurately and with minimum effort required at the handlebar to initiate direction changes. The torquey motor aids backroad progress, too, by providing good drive out of any corner, in any gear, at any engine speed. Further, the throttle can be chopped in mid-turn without unsettling the bike or producing graunching, metal-to-pavement contact. In fact, nothing graunches. If you do touch something down, it will be the pegs, but you'll have to work at it because the undercarriage is well tucked-in. The suspension, too, is tuned for sport, but only up to a point. It's still BMW-supple, producing good wheel control even over rough, irregular pavement, but it is more tautly sprung than previous BMWs have been, which is more in keeping with the sportier nature of the K-series. But make no mistake: The K100s are not full-on sportbikes—not, at least, in the way in which something like a Honda Interceptor fits that definition. Even with the rear suspension dialed up to the stiffest (of three) preload settings, stuffing the K into a corner hard will let you discover the dividing line between sportbike and sport-tourer.

Still, compared to the R100s they'll replace, the K100s push that dividing line closer to the pure sport end of the spectrum, both in engine and chassis performance. And that push is not far off. The K100 series, available right now in Europe, will arrive in American showrooms in late fall of 1984. Their arrival will, no doubt, be viewed with mixed emotions by some, since it also marks the end of the R100 series. But don't think that BMW has given up on opposed-twins; R65s and R80s continue to be part of BMW's long-range plans.

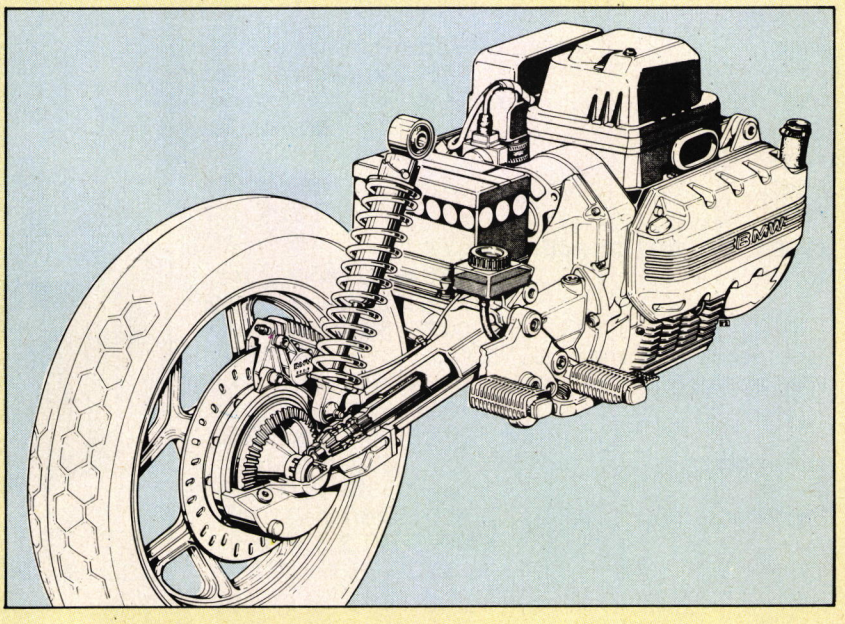
And, disgruntled would-be R100 owners notwithstanding, the ongoing production of Boxer twins is proof that, at least at BMW, "They still make them like they used to." But with the K-series bikes as evidence, you should understand that they also make them *better.* •

The Flat-Four, BMW-Style





The K100 bristles with innovation, mostly in the way in which its inline four-cylinder engine has been laid horizontally in the chassis; technologically, however, the liquid-cooled, DOHC engine itself is quite conventional, right down to its one-piece forged crankshaft, insert-type plain bearings, three-ring alloy pistons and two-valve-per-cylinder combustion chambers. Even the 38-degree included valve angle and the shim-and-bucket valve-adjustment system are common fare on contemporary motorcycle engines. Also of interest—but not original—is the contra-rotating output shaft, which not only drives the single-plate dry clutch, the 460-watt alternator and the pumps for both the oiling and cooling systems, but it also helps offset the torque reaction inherent with longitudinal-crank engines.



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CYCLE GUIDE SPECIFICATIONS

BMW K100/K100RS/K100RT — street

MANUFACTURER: BMW Motorrad GmbH, Hufelandstrasse 8 F, Munich, West Germany

SUGGESTED RETAIL PRICE: N/A

ENGINE

Type . . . . liquid-cooled four-stroke longitudinal horizontal four
Valve arrangement . . . . . double overhead camshafts
Bore and stroke . . . . . 67.0mm x 70.0mm
Displacement 987.2cc
Compression ratio 10.2:1
Engine redline . . . . . 8500 rpm
Carburetion . . . . . Bosch LE-Jetronic fuel injection, four 34mm throttle bodies
Air filter . . . . . disposable paper element
Lubrication . . . . . .wet sump
Starting system . . . . . electric only
Ignition . . . . . .transistorized breakerless
Charging system . . . . . .12-volt; 460-watt alternator, voltage regulator/rectifier, 20-ampere-hour battery

DRIVETRAIN

Primary drive . . . . . .helical gears; 1.000:1 ratio
Clutch . . . . . dry, single-plate
Driveshaft-to-rear-wheel drive . . . . . spiral-bevel gears; 2.909:1 ratio

Gear	Internal gear ratio	Overall gear ratio	MPH per 1000 RPM
I	4.497	13.082	5.94
II	2.959	8.608	9.02
III	2.304	6.702	11.59
IV	1.879	5.466	14.21
V	1.667	4.849	16.01

SUSPENSION

Front . . . . . BMW, 41.4mm stanchion tube diameter/ 7.3 in. (185mm)
Rear . . . . . .single Boge shock, 3-position adjustable spring preload/ 4.3 in. (110mm)

BRAKES

Front . . . . . dual double-action hydraulic calipers, 11.2-in. (285mm) discs
Rear . . . . . .double-action hydraulic caliper, 11.2-in. (285mm) disc

TIRES

Front 100/90V18
Rear 130/90V17

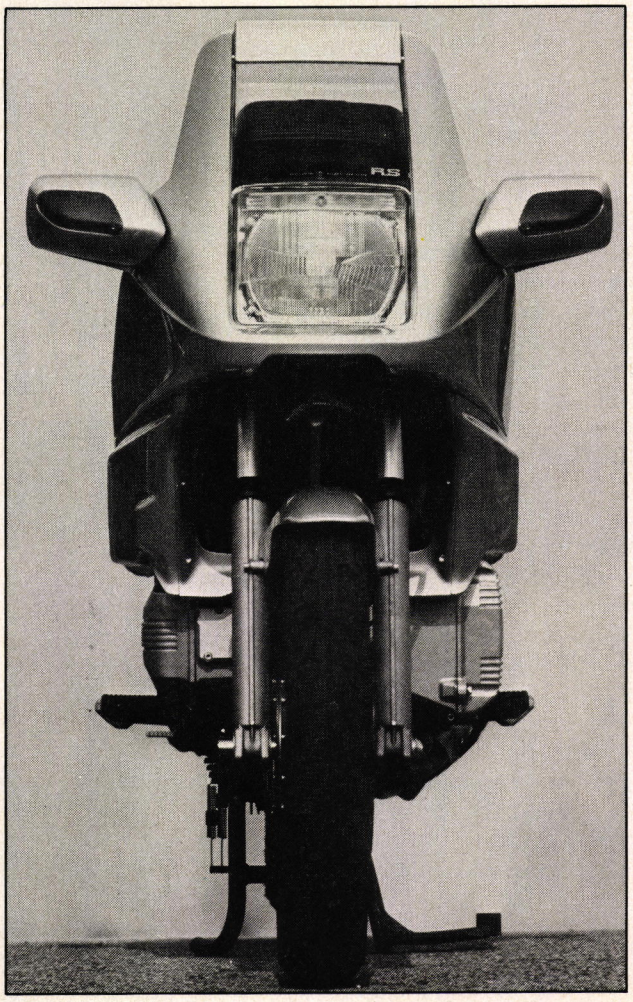
DIMENSIONS AND CAPACITIES

Weight . . . . . K100=492 lbs. (223.1kg); K100RS=514 lbs. (233.1kg); K100RT=525 lbs. (238.1kg)
Gross vehicle weight rating (GVWR) . . . . . 992 lbs. (450kg)
Load capacity (with full fuel tank) . . K100=465 lbs. (211kg); K100RS=443 lbs. (201kg); K100RT=432 lbs. (196kg)
Wheelbase . . . . . .59.7 in. (1516mm)
Seat height . . . . . .31.9 in. (810mm)
Handlebar width . . . . . K100=28.7 in. (730mm); K100RS=27.2 in. (690mm); K100RT=30.3 in. (770mm)
Ground clearance . . . . .5.9 in. (150mm), at crankcase sump
Steering head angle . . . . . 26.5 degrees from vertical
Front wheel trail . . . . . .3.98 in. (101mm)
Frame . . . . . .tubular steel, double front downtubes
Oil capacity . . . . . 4.0 qt. (3.8*l*)
Fuel tank . . . . . .steel, 5.8 gal. (22.0*l*), including 1.8 gal. (7.0*l*) reserve
Instrumentation . . . . . speedometer, odometer, tripmeter resettable to zero, tachometer, digital gear-position indicator, bulb-type monitoring system, digital clock (optional on K100)

PERFORMANCE

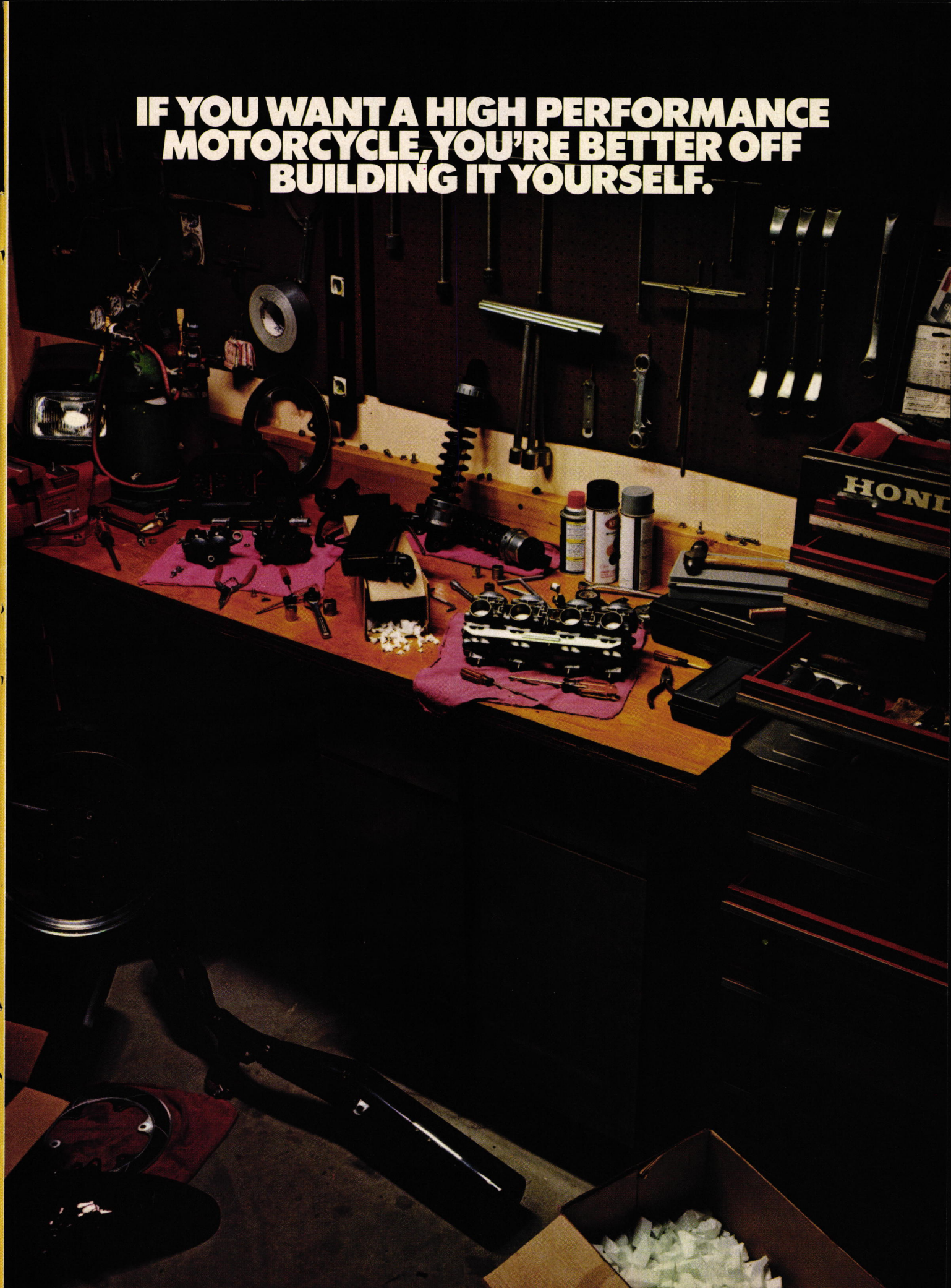
Best 400-meter acceleration . . . . . .12.0 sec.
Top speed . . . . . K100 & K100RT=134 mph (215 km/h); K100RS=137 mph (220 km/h)

AVAILABLE COLORS: K100=red or silver; K100RS=black or burgundy; K100RT=slate blue or silver



All specifications and performance data are the manufacturer's claims, not information compiled by the CYCLE GUIDE staff.

IF YOU WANT A HIGH PERFORMANCE MOTORCYCLE, YOU'RE BETTER OFF BUILDING IT YOURSELF.



THAT'S EXACTLY

There are two ways to get a really high-performance bike.

One is to buy an entire motorcycle for the engine alone. Spend a small fortune on performance accessories. Retire to your garage.

And after weeks of bending, drilling and adjusting your "bolt-on" parts, you might wind up with a bike almost as good as the Nighthawk™ S.

Of course the other way is to simply get a Nighthawk S.

In fact, you might be tempted to buy it for the engine alone. It's more powerful, more compact and narrower than anything in its class. An in-line four that pumps an incredible 80 horses* through a six-speed transmission and a virtually maintenance-free shaft-drive system.

Our exclusive hydraulic valve adjuster system keeps it at that just-tuned state of high performance. With no valve adjustments. Ever.

The engine comes wrapped in a chassis that's equally outrageous. With a 16-inch front wheel and steering geometry

ALWAYS WEAR A HELMET AND EYE PROTECTION. The Nighthawk S has a
Specifications and availability subject to change without notice. *SAE net taken at the crankshaft.
© 1983 American Honda Motor Co., Inc. For a free brochure, see your Honda dealer.

HOW WE FEEL.

that make the Nighthawk S incredibly agile on tight, twisty roads.

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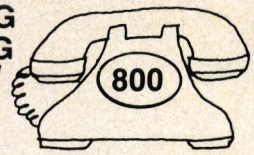

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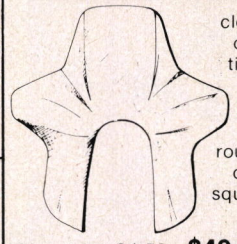

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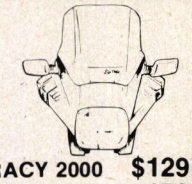

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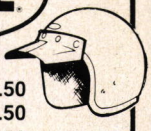

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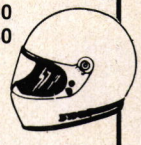

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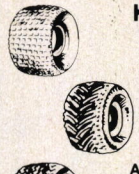

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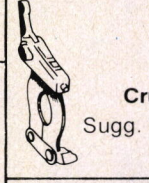

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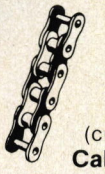

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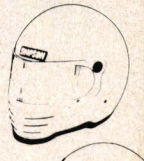

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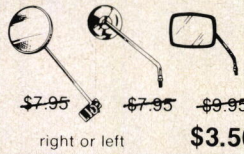

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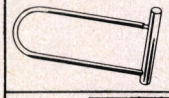

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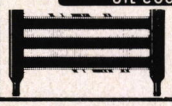

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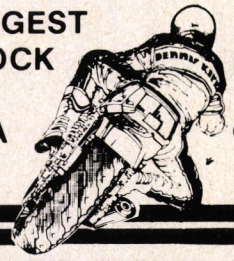

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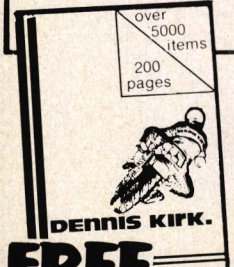

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DENNIS KIRK.

1984

Five All-New Yamahas

Everyone always knew that someday, Yamaha would do it. That someday is now.

There's a strange new word echoing through the halls at Yamaha these days, one that you'll hear at the mere mention of that company's lineup of streetbikes for 1984. The word is "performance."

Now, there is nothing either "strange" or "new" about that word itself, but its use as a descriptor of Yamaha street motorcycles is highly unusual. Because while Yamaha has been renowned for many things in recent years—including a total commitment to roadracing, and for being at the cutting edge of the custom-cruiser phenomenon—street performance has not been one of them.

Until now. Granted, mean-streets cruisers are still an important part of Yamaha's battle plans for the upcoming season, but they're not, as in recent years, practically the *only* part. Instead, just two new custom models are included in the '84 line, both of them Viragos—an ITC-skirting 700, and a 981cc version (called the Virago 1000) that replaces the 920. Their appearance has also been rethought, taking more of an American Traditional (read: H-D) approach to cruiserbike styling rather than the Japanese Modern look of previous Viragos. But more to the point, Yamaha finally will try to capitalize on its unprecedented success in roadracing by offering a serious high-performance sport model in each of the three basic size ranges: the RZ350L, a liquid-cooled twin-cylinder two-stroke lightweight; the FJ600, an air-cooled inline four-cylinder middleweight; and the FJ1100, also an air-cooled inline four-stroke four, but in the heavyweight category.

And the truth is, even "serious" falls short of accurately describing how these sportbikes actually perform, a fact we learned while riding them during Yamaha's new-model introduction at Willow Springs Raceway. As you are about to see in the riding impressions that follow, we're talking about racebikes with lights, about all-out, take-no-prisoners street weapons that just might end up dominating their respective classes, whether they're carving up the twisties, launching through the quarter-mile or locked in the wheel-to-wheel combat of stock-class roadracing.

What's more, these three sport models address one of motorcycling's most-asked questions. Enthusiasts have wondered for a long time just what might happen if Yamaha, unquestionably the dominant force in roadracing over the past 15 years, ever put all of its vast racing knowledge to work in the development of street-going performance machinery.

In 1984, they seem likely to find out.

Continued

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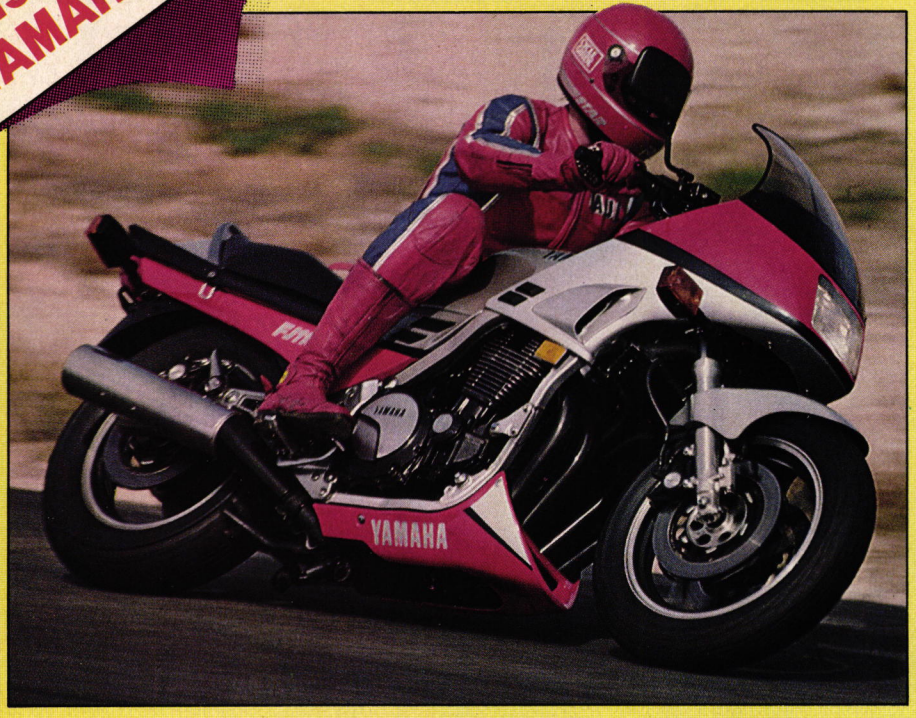
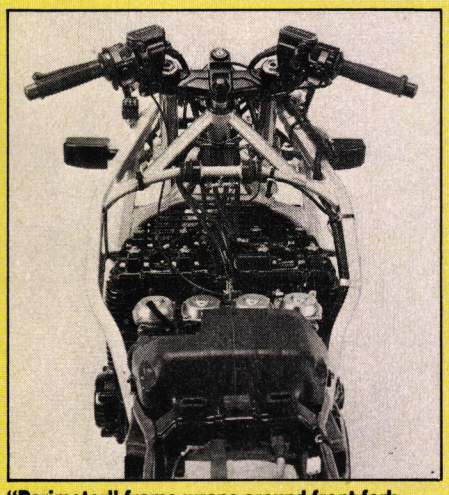
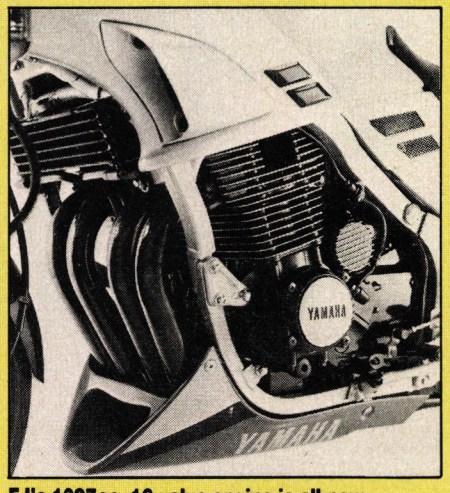




"Perimeter" frame wraps around front fork

From Yamaha's bag of GP-racing tricks.



FJ's 1097cc, 16-valve engine is all-new

And with 125 horses on tap, all-business.

FJ1100

One ride verifies what one look suggests: This is The Real Thing.

• It's easy to make two serious mistakes when sizing-up the FJ1100, Yamaha's long-overdue entry into the hyperbike wars. For one, it's easy to think that this new model is, in some way, merely a warmed-over XS1100 of a few years back. That's wrong, since the only thing the 1097cc FJ1100 and 1101cc XS1100 have in common is the Yamaha name on their gas tanks. And it's just as easy to assume that since Yamaha is the last of the Japanese Big Four to jump into the literbike performance arena, the FJ1100 must lag behind its competition in some way. That's wrong, too, because regardless of whether it's mind-fogging performance, state-of-the-art technology or even the irresistable sex-appeal that well-executed sportbikes can exude, the FJ1100 takes a back seat to absolutely *nothing*.

Fact is, if Yamaha's claims mean anything at all, the FJ1100 could prove to be motorcycling's new King of Speed. The factory says that the all-new, 16-valve, air-cooled inline-four will unleash an honest 125 horsepower at the flick of the wrist; and that, Yamaha insists, in concert with a claimed dry weight of just 501 pounds and aerodynamics alleged to make the FJ one of the slipperiest streetbikes ever, nets a top speed well in excess of 150 mph, with quarter-mile times in the mid-*tens*.

Nothing we experienced at Willow Springs indicated that Yamaha's claims are unfounded. Frankly, it's hard to find a superlative that doesn't accurately describe the 1100's relentless acceleration. Awesome, ferocious, fearsome, even *frightening*—they all truly apply. We saw 147 mph on the speedometer down Willow's front straight, but even at that point, the exceptionally smooth, rubber-mounted transverse-four still was pulling hard enough to slide the rider back on the seat. And the low-slung FJ was just as impressive in the corners, knifing through Willow's nine turns with surgical precision, never requiring a lot of muscle, never giving off the slightest trace of a wiggle. All in all, the 1100 looked, felt and acted just like a for-real racebike.

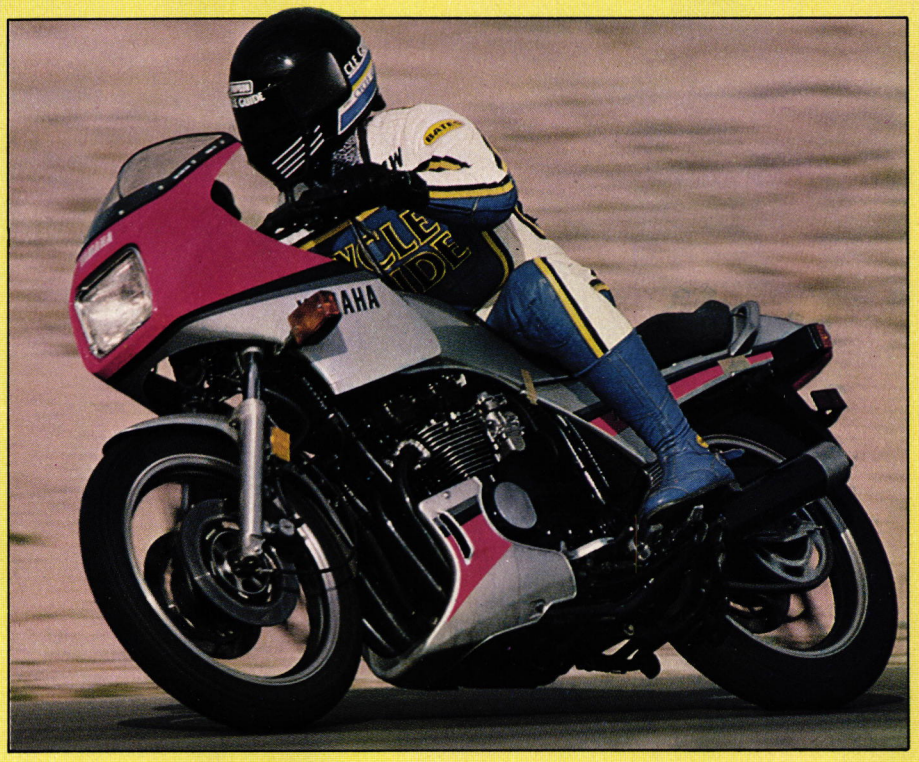
And well it should, since it's *built* like one. The box-section tube frame, for example, uses the same "perimeter" design found on Yamaha's GP roadracers. The frame wraps way out around the entire front fork assembly, connecting to the steering head through a series of short, angled tubes. Yamaha claims that the massive triangulation of this design, along with the wide lateral spacing of the main frame members, gives the frame tremendous structural integrity. What's more, the wraparound front frame loop allows a more straightforward mounting of the wind-tunnel-designed half-fairing, and the widely spaced backbone tubes permit the engine's top-end components to be removed without pulling the entire motor out of the frame.

Racing also spawned the FJ's 16-inch front wheel, as well as a 16-inch rear shod with an absolutely *mammoth* 150/80 V-rated tire that looks for all the world like a Formula 1 roadrace slick with a bit of tread cut in it. And the FJ1100's suspension—both the anti-dive front fork and the Monocross single-shock rear—features damping adjusters linked to preload adjusters so that any alteration in the spring preload is accompanied by a proportionate change in damping rate.

Obviously, then, the FJ1100's sensational performance is due not to dumb luck of engineering, but rather to Yamaha's oft-proven expertise in the fine art of building world-beating roadracing machinery. Yamaha might have taken its good old time about coming up with a hyperbike contender; but based on our first impressions, the FJ1100 seems well worth the wait. —*Paul Dean*

FJ600

Yamaha's middleweight will get its sport reputation the hard way—by earning it.



• With all of the attention that's going to be paid to Yamaha's *other* new sportbikes, the FJ600 just might get pushed out of the limelight. After all, this straightforward transverse-four middleweight isn't, as is the RZ350, the triumphant return of two-strokes to U.S. streets; nor is it, as Yamaha proclaims of its new FJ1100, destined to be 1984's fastest production bike.

And perhaps, in specification, the 600 *is* unspectacular by 1984 standards. Its all-new chassis includes Monoshock rear suspension (with preload set via a remote adjuster), but neither the deCarbon shock nor the air-assist fork allows damping adjustment. On top of that, the 600 makes its sporting debut bereft of either a 16-inch front wheel or a square-section tube frame. For those who adhere to sport chic, that makes the 600, despite its FJ1100-inspired bodywork, nearly naked at the cotillion.

Discounting the 600 as a sportbike lacking the requisite racy filigree not only misses the point, though, it dismisses what might well be the best middleweight sporter for 1984. What's important with the 600 is what's *in* the package, not what's missing; and what's in the 600 is sound, established engineering.

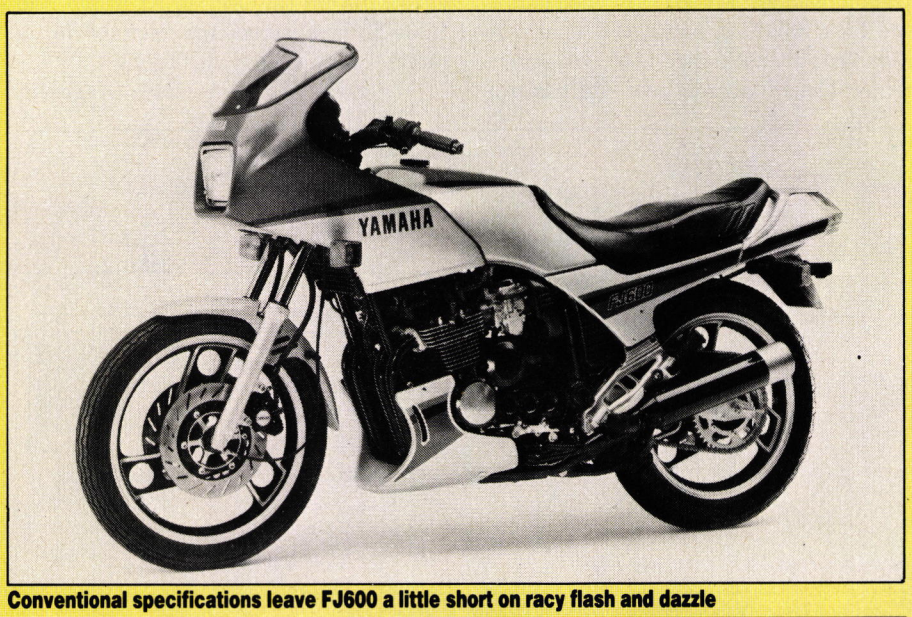
The engine is based on the eight-valve Seca 550 powerplant, and is extremely compact. And, more was done to the original 528cc motor than the bore-and-stroke that brought its displacement up to 598cc. In revamping the 550's engine Yamaha engineers altered combustion-chamber shape, valve sizes, cam profiles and timing, carburetor size and airbox capacity, all to achieve one specific goal: performance. Even fuel mileage took a back seat to engine performance: YICS, Yamaha's mileage-boosting interconnected inlet plumbing, was dropped when it was found the engine pulled stronger—although at a somewhat higher fuel-consumption rate—without it.

And the resulting powerplant *does* pull. Below 7000 rpm the engine offers good power for a middleweight streetbike; nothing is lacking. Above that engine speed, though, the 600 is all *sport*-bike, and easily revs to its 10,500-rpm redline in five of its six gears. And in sixth, the prototype FJ600 we rode managed almost 10,000 rpm—and an indicated 125 mph—down Willow's back straight.

Just as important as engine performance is handling, and in that area the 600 gives away very little. At a claimed 415 pounds, the FJ600 is among the lightest of the sport middleweights, and its lack of excess poundage pays off in every corner. And the 600's relatively quick steering geometry (26 degree steering head angle, 4.17 inches of trail), lets you flick the bike through those corners without muscling it—and without turning it twitchy at speed. Hauling down from speed is equally predictable, thanks to the 600's excellent triple-slotted-disc brake setup; the only flaw we found in the 600's braking was a tendency toward nosedive in full-on stopping. Overall, from ride quality to ground clearance to ergonomic layout, the 600 displays impressive performance credentials, either for closed circuits or the open road.

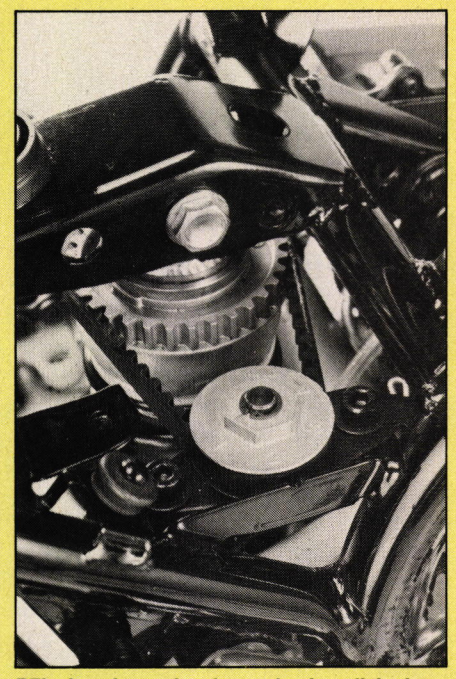
So, even though the FJ600 might be starting 1984 a little out of the spotlight, we're betting it won't *end* the year that way.

—Larry Works



Conventional specifications leave FJ600 a little short on racy flash and dazzle

But its performance will speak for itself.



RZ's damping and spring preload are linked

Fingertip adjustment for both.

RZ350L

The two-stroke pocket-rocket returns to America.

• The two-stroke streetbike has returned. It's Yamaha's RZ350L and it's going to be the best under-$2500 sportbike in America for 1984, bar none. If you read our test of the Canadian-version RZ350 (December, 1983 issue), you know the bike is a second-generation version of the RD350L/C with a broader powerband and more peak horsepower than any RD ever had.

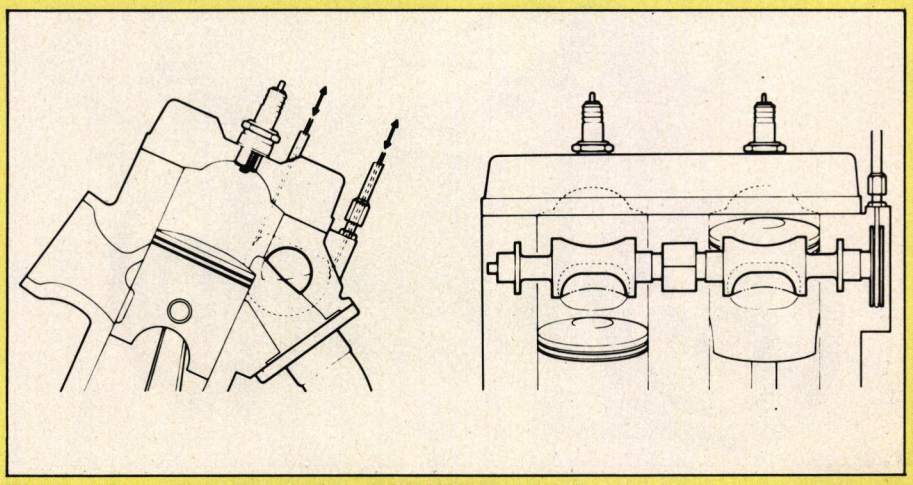
But some of the original RZ's horsepower was lost at the U.S. border. To conform to the EPA's rigid emissions regulations, Yamaha had to make some changes to the RZ350's engine, including a pair of two-stage catalytic convertors in the exhaust system, and EPA-pleasing carbs to match. Yamaha claims a net loss of about five horsepower in the transformation. Furthermore, the engine still couldn't pass California's strict clean-air standards, so the Americanized RZ will be sold only in the other 49 states.

Even with the emissions hardware, though, it's difficult to tell that there is indeed less horsepower. The U.S.-version RZ350 carburates crisply, and the powerband stretches from 3500 to 9500 rpm, 500 rpm below the engine's ten-grand redline.

And because this two-stroke doesn't exhibit the same pipey, explosive power characteristics of previous RDs, you can spend your riding time concentrating on clipping apexes, rather than watching the tachometer needle. To be sure, the RZ feels a little fidgety entering a corner; light, quick steering is an RD trait, and the RZ350L is no exception. But the quick steering makes it easy to string together a series of turns, so you can flick the 330-pound (claimed dry weight) pocket-rocket from side to side, and little body movement is necessary. Also part of the RZ's handling package is a suspension system that's race-bred, yet street-ready. The Monocross rear end has progressive spring rates, and preload can be altered by means of a remote adjuster behind the right sidecover. The air-assist fork has progressive springing *and* damping, and should provide a compliant ride both for street use and for roadracing—which many RZs undoubtedly will be subjected to.

And in keeping with its racing heritage, the RZ350 will come in two familiar color schemes: About half of the approximately 4000 units destined for America will be in Yamaha's red-and-white international racing colors. The remainder will be yellow-black-and-white Kenny Roberts Special Editions, with KR's autograph on the fairing. At $2395, the RZ350L is a screaming bargain for a racer—or for a racer with lights.

—Dain Gingerelli



TZ-derived Power Valve system broadens RZ350L's powerband

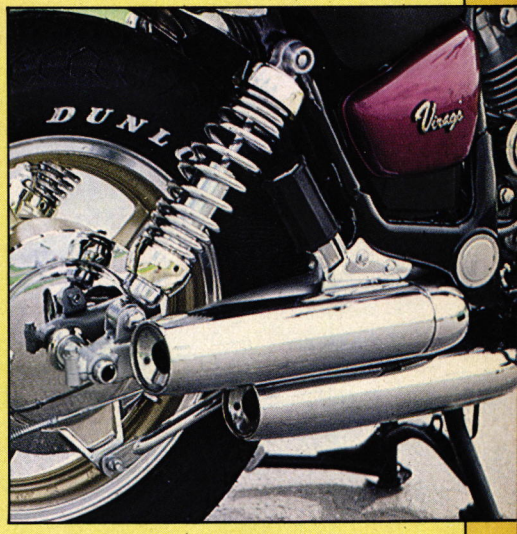
From the racetracks of Europe to the streets of the U.S.

Virago 700 and 1000

If you've already paid the piper, you might as well get up and dance.

Engine displacement is changed from '83

But the vee-twin appeal never changes.



Twin shocks and twice-pipes are new Virago

But the look is old Milwaukee.

• Yamaha's stylists are whistling a different tune this year. We're not sure of the title, but the notes were penned in Milwaukee with lyrics by the ITC. Yamaha might not know the name, either, but it certainly knows the score, which is written all over the new Virago 700 and 1000. Yamaha's vee-twin cruisers are completely redesigned this year, and the theme for the change is Milwaukee-bred, and as American as John Philip Sousa.

And the H-D-influenced styling *is* a change, because since the beginning of the cruiser wave, Yamaha customs have been decidedly non-Harley in appearance, a blend of English Traditional and Yamaha New Wave. While some of that mix remains in the new Viragos, the new features for 1984—staggered dual exhausts, side-mounted air-filters, "split-look" seats and an all-new, twin-shock chassis—have distinct Milwaukee overtones.

Yamaha isn't talking, but the shift in styling themes is understandable. The ITC tariff on 700cc-and-larger motorcycles has effectively removed any reason *not* to copy H-D's styling, and the runaway success of last year's Harley-look Honda Shadows is a powerful argument for an All-American styling theme.

The ITC decision figures into more than just styling for the Virago 700. To avoid the tariff on the smaller of its two new vee-twins, Yamaha reduced the displacement of its 749cc engine to 699cc, 1cc under the ITC's cutoff point. And for those riders willing to pay the ante for front-row performance, Yamaha also has the Virago 1000, a high-zoot cruiser decked out with gold accents and five-spoke, mag-style wheels instead of the 700's chrome and wire-spoke wheels. The 1000's engine is based on the 920, but the displacement is up to 981cc. In addition to its larger engine and more elaborate trim in comparison with the 700, the 1000 also features more suspension adjustment. The 1000 has an air-assisted front fork, and adjustments both for damping and preload at the rear. The 700 has a spring-only fork, and adjusts only for preload at the rear.

The two Viragos are otherwise quite similar, so it's not surprising they handled alike at Willow Springs. Although a racetrack is far from a cruiser's home turf, both bikes took to the nine-turn course surprisingly well. The steering on both bikes felt light, and both were stable and predictable when pressed through corners. A lack of cornering clearance was also predictable, but once set up in a corner, neither cruiser wallowed or felt underdamped. Off-track performance was equally good; on a test ride over some of the pockmarked roads around the racetrack, the 700 displayed excellent suspension compliance. Differences between the two showed up most clearly, of course, in engine performance. The 700 was remarkably smooth, but the engine was noticeably weaker on the low-end than last year's 750. There's no such lack of power with the 1000, however; the larger engine makes good power just off idle, and it has the kind of flat powerband and instantaneous response that have endeared vee-twins to American riders for years.

Viragos have always been competent on-road performers, and despite the 700's understandably softer power, the new ones are even better. The problem recently has been their showroom performance. But for this year, Yamaha has given the Viragos the look that might very well move them out from behind the Shadows.

—Jim Miller •

COMPARISON TRACK TEST:

Honda CR250R, Kawasaki KX250, Suzuki RM250, Yamaha YZ250

Choosing a motocrosser today is like shopping for groceries at Baskin-Robbins: There are plenty of flavors, but ice cream is ice cream, regardless of its color. And as far as Japanese 250cc MXers are concerned, it seems that a motocross bike is a motocross bike, whether it's yellow, red or green. Japan's four offerings in the 250 class have become strikingly alike; and if trends persist, the bikes will continue to become even more similar until the differences fade away and we're left with one universal MXer.

Evidence of that ongoing MX homogenization is visible on any start line at any racetrack around the country. Whether you focus on a Honda, Kawasaki, Suzuki or Yamaha, you'll see pretty much the same bike: a liquid-cooled, reed-valved, five-speed single-shocker. Any differences in their dimensions are best measured with a micrometer rather than with a ruler. As a result, riders with a taste for variety will find today's menu of MX treats lacking in true choice.

Of course, this trend toward MX clonehood is a by-product of the same process that makes today's motocross bikes better than ever before. You see, in the ultra-competitive world of production motocross equipment, there's only a thin line separating a winning bike from a losing bike. That line can manifest itself in the form of, say, a Power Valve, or maybe a front disc brake. But whatever that apparent advantage might be, if it works, in following years it will be the rule rather than the exception on all the other bikes.

That's why motocross machinery can't help getting better. And in the 250 class, that process is as evident this year as ever before. Honda's CR250R, for example, is completely changed, but its two most important new features are the ATAC—a direct retaliation to the Yamaha Power Valve System—and a front disc brake—a feature that made its motocross debut on Kawasaki's mean green KX models. Suzuki isn't above borrowing technology, either. Most of the new RM250's refinements are in the chassis department, where the rake and trail are remarkably similar to the Honda's. The Kawasaki and the Yamaha 250s also sport a list of features that make the overall trend clear: MX bikes, especially the 250-class models from Japan, slowly are blending into one exceptionally tasty flavor of motocrosser.

Don't think, though, that all of this intra-industry idea-borrowing has led to motorcycles so much alike that deciding between them has become unimportant. The point of absolute equality is not yet here, and it might never come. If four riders of equal skill were given these bikes and told to race for 30 minutes, a half-hour later there *would* be a winner; draws and ties are for other sports. First place might be won by only an inch, but when the checkered flag drops, that inch is every bit as good as a lap.

You could attribute that victory to luck, if you wish; but since luck is something you can't buy, each rider has to look for the bike that might give him even a slight advantage over the others. And that's why these four machines are gathered here. All of them can win, obviously, but only one of them can deliver that extra inch. The question is, *which* one?

Continued

PHOTOGRAPHY © 1984 DAVID DEWHURST

topping the 250 class.

BY RON LAWSON

Which Will Win?

• Comparing these four motocross bikes means getting out your magnifying glass, because this is the closest shootout ever. Not that each bike doesn't have its own personality; it's just that in terms of sheer performance, picking a winner here requires picking nits. They're that close and they're that good.

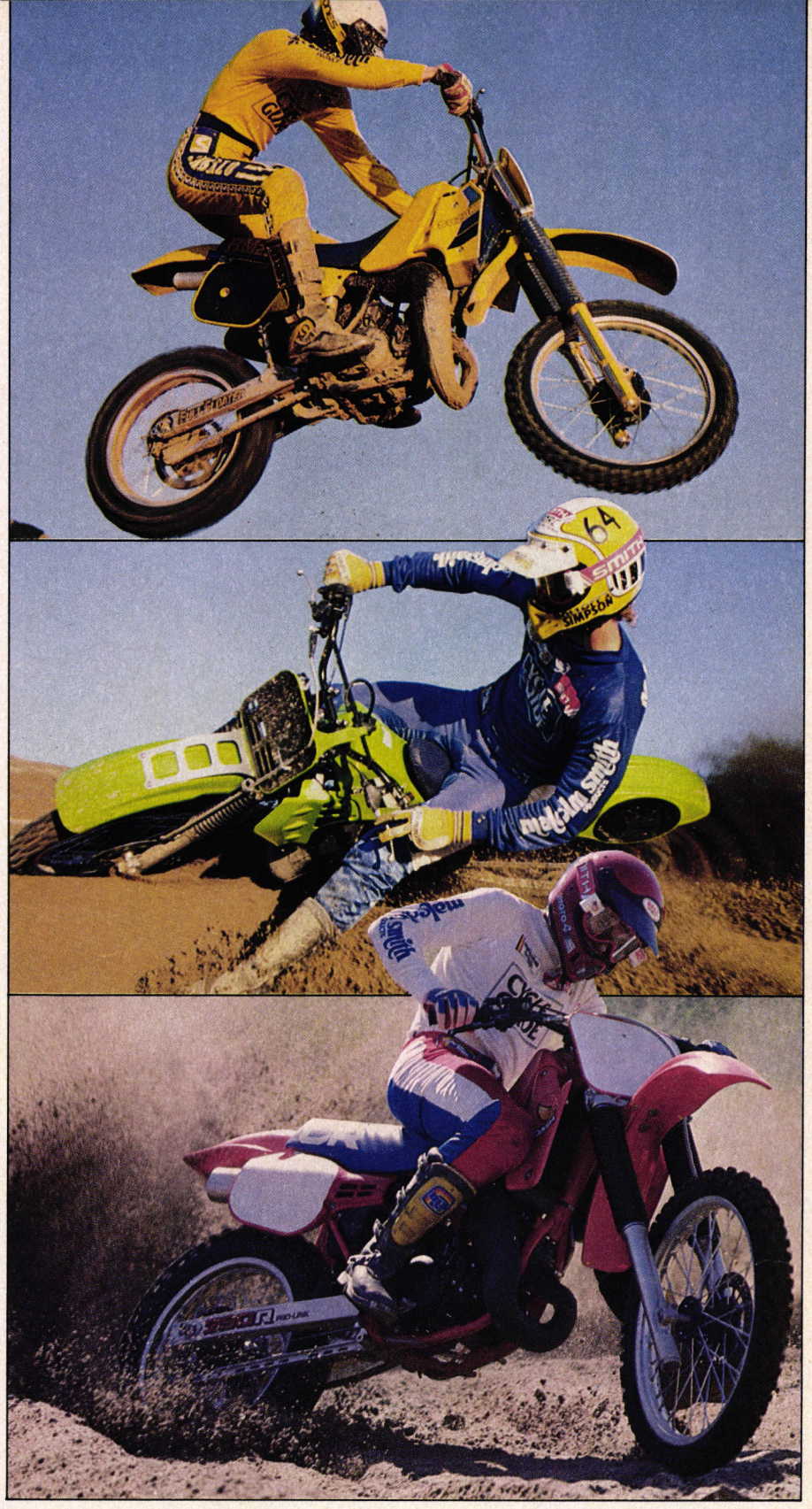
Scrutinizing the powerbands of the four machines proves the point. All are remarkably similar and have smooth, low-rpm power deliveries—there's not a pipey screamer in the bunch. One bike's engine, however, does stand out. Even though the YZ isn't the fastest of the four, it has, simply stated, the broadest powerband of any 250cc MXer ever offered for sale. You almost can't fall off the pipe on the YZ, for thanks to a Power Valve that really works, the Yamaha has low-end power that rivals, and even *exceeds,* that of many Open-classers. And raving about the YZ's low-end power isn't a backhanded way of saying the bike doesn't pull well on top, either. The YZ consistently was second into the first turn in repeated start-line dragraces.

First place in those races, however, usually went to the Honda. The CR is the fastest-accelerating 250 of the bunch, and in low-end power, it isn't far below the Yamaha. Perhaps one good indication of how efficiently the Honda's motor works is that the CR doesn't feel fast, it just *goes* fast. In fact, unless you jump directly off one of the other machines and onto the Honda, chances are you'll think it's just an average 250, accelerating at an average rate. But actually the CR is far more than just average.

On the other hand, the Kawasaki's power *is* average. Two facts immediately become clear about the KX: First, it revs higher than do any of the other machines; and second, that extra rpm doesn't help it outrun the other 250s. The KX engine produces crisp, responsive power over a fairly broad range, its only fault being that it doesn't produce a *lot* of power at any one point. This results in an easy-to-use powerband, but one not likely to get holeshots.

Getting to the first turn ahead of the pack on the Suzuki can be just as difficult. At first, the RM250 *seems* to have a throaty, Open-class-type power delivery, but after a little time in the saddle it becomes apparent that most of the power is concentrated in the midrange. At low rpm, the Suzuki doesn't pull as strongly as either the Honda or the Yamaha, and it signs-off earlier on the top-end as well. This isn't a severe shortcoming in itself, but it's magnified by transmission ratios that are a bit too widely spaced. Consequently, clutch-fanning is a necessary ingredient for keeping the RM in the desired rpm range. While in that range, though, the RM is formidable, and the engine has enough flywheel effect to keep the delivery smooth and tractable.

What the Suzuki lacks in the engine is made up for, however, in the suspension, a fact we proved when we took the four 250s to Carlsbad Raceway, which generally is regarded as the roughest track in Southern California, if not one of the



Tech Inspection:

Honda CR250R

ENGINE:

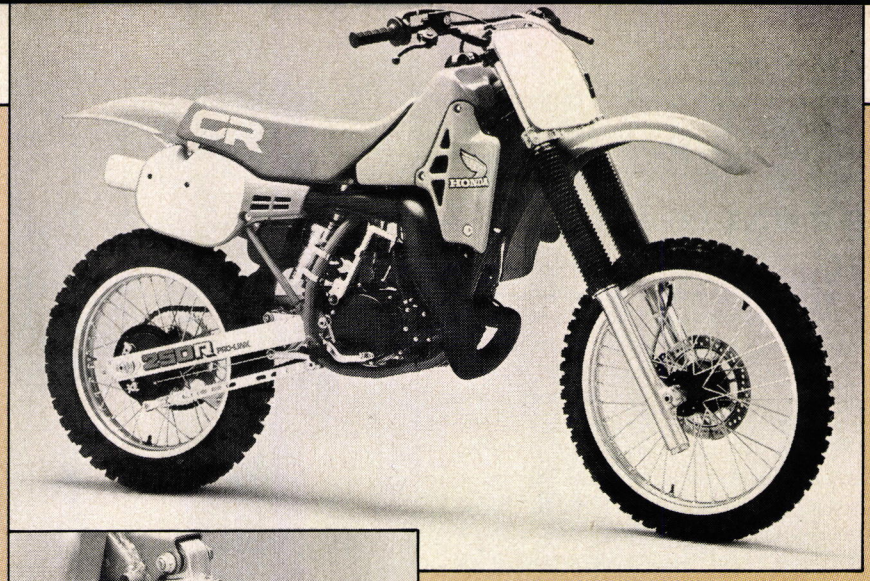
The CR250R engine has been completely redesigned for '84. Its most significant new feature is the Automatic Torque Amplification Chamber (ATAC), a system designed to broaden the powerband by altering the tuning of the exhaust header pipe according to engine rpm. At low revs, a crankshaft-driven ball-ramp device opens a butterfly valve that links the exhaust manifold to a separate, 170cc chamber, thus bolstering the power output at lower engine speeds. At higher revs the valve is closed, and the resultant decrease in header-pipe volume benefits high-rpm power output.

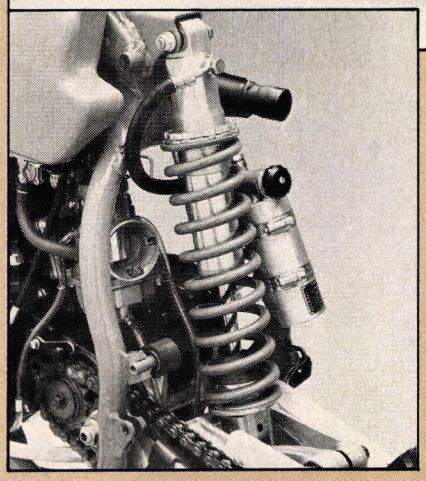
Use of the ATAC gave rise to other tuning changes relative to last year's CR, such as a higher compression ratio, a taller and unbridged exhaust port, wider transfer ports and a lower intake port. The new CR also has a lighter crankshaft, but the overall flywheel effect is increased due to the switch from the internal-rotor ignition used last year to the external-flywheel type.

Drivetrain: The '84 CR250R engine is a mirror-image of last year's—that is, everything that was on the right side of the engine is now on the left, and vice-versa. Basically, this was done for three reasons: to move the kickstart lever to the right side for easier starting; to allow the rear brake pedal to be tucked in behind the frame without interfering with the chain (which also is now on the opposite side); and to allow a narrower swingarm and rear-wheel hub. The clutch has new drive plates that are thicker and contain more asbestos to better withstand the heat of clutch-fanning. All of the internal gear ratios are unchanged, but different primary and final-drive ratios net slightly taller overall gearing.

CHASSIS:

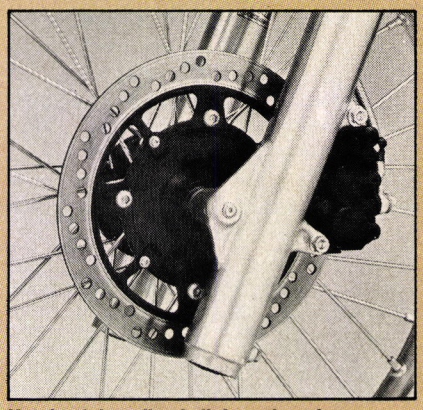
Frame: The CR's steering head angle is the steepest of the four, at 26.7 degrees. This year, the steering head sits 5mm lower and 5mm further to the rear to place more weight on the front end. In most other ways, the frame is similar to the '83 CR's. The rear section still unbolts to allow access to the shock; and, like the KX, RM and YZ, the CR has a single front downtube that splits into two smaller tubes just in front of the exhaust port.





Honda's rear frame-section disconnects

And shows the Showa shock.



Honda claims disc is lighter than drum

At least, in unsprung weight.

Wheels: The CR now has a hydraulic front disc brake system that Honda claims results in less unsprung weight, but more overall weight due to the large, handlebar-mounted reservoir and lever assembly. The CR still uses straight-pull spokes and steel nipples with DID rims.

Rear Suspension: The Honda has the simplest shock linkage of the four 250s, using just two links at the base of the shock to achieve rising rates of springing and damping. This year, those rates are more linear than before, and overall, there is less leverage on the shock. This required a softer spring and, to maintain the same amount of rear wheel travel as in '83, necessitated a shock with a longer stroke. The damping-adjustable Showa shock has 17 rebound settings and 22 possible compression-damping positions.

Front Suspension: Few changes have been made to the Showa fork. Stanchion-tube diameter remains at 43mm, and compression damping still can be altered by turning a screw in the bottom of each fork leg. This year, though, slight internal changes result in increased medium-speed compression damping.

DETAILS:

Although the fuel tank is similar in appearance to last year's, it has a greater capacity. The numberplates also are larger, and the airbox has been reconfigured to lessen the likelihood of water-inhalation. The handlebar now is rubber-mounted, the footpegs are wider than last year's, and the CR has new Bridgestone (M37 front and M38 rear) tires.

roughest in the *world*. In that kind of setting, the RM shines. Suspension at both ends of the bike is stiffer than that of the other machines, making the RM a natural in rough terrain. And the suspension is versatile, too. It suits a broad range of riders on the standard damping settings (No. 2 rebound and No. 2 compression on the rear shock, four turns out on the fork), and dealing with different types of tracks requires only a turn or so of change in the shock preload.

At Carlsbad, the Honda ranked second in suspension efficiency. The CR is softer and slightly less predictable than the RM, although it never bottoms harshly, even on the biggest whoops. And on smoother, more-typical tracks the Pro-Link has an edge on the Floater. The CR's softer springing allows it to soak up small, choppy bumps with ease, whereas the RM sometimes gets jittery. The Honda's fork has an advantage over the others, too, even though all the forks are similar in their overall behavior—which in all cases is excellent. But the CR fork is the only one of the four that has an ad-

Continued

Tech Inspection:

Kawasaki KX250

ENGINE:

Kawasaki claims that, compared to the '83 model, the new KX250 has a two-horsepower increase throughout most of the rpm range. This was accomplished, for the most part, by enlarging the two auxiliary exhaust ports in the linerless, Electrofusion-coated cylinder. In addition, the transfer ports are wider, the exhaust pipe is all-new, the ignition curve is more advanced and the compression ratio is higher. Replacing last year's Keihin carburetor is a 38mm Mikuni with an "R Bottom" slide (one with a longitudinal groove along its bottom) that is claimed to improve fuel-atomization at small throttle openings. The new carb feeds through an eight-petal carbon-fiber reed valve identical to that used on the previous KX. The cases are new this year, and are thicker at all mating surfaces for better sealing.

Drivetrain: All of the KX's gear ratios are unchanged this year, right down to the final drive. Kawasaki has attempted to remedy the abrupt clutch engagement suffered by last year's KX by making all seven of the fiber drive plates thicker. The six steel driven plates are unchanged.

CHASSIS:

Frame: The new KX retains the 28.5-degree rake, 118mm of trail and average wheelbase of the previous one. This year, however, the twin radiators are mounted 50mm lower to bring down the bike's center of gravity. And the rear frame rails are angled upward to accommodate increased rear wheel travel.

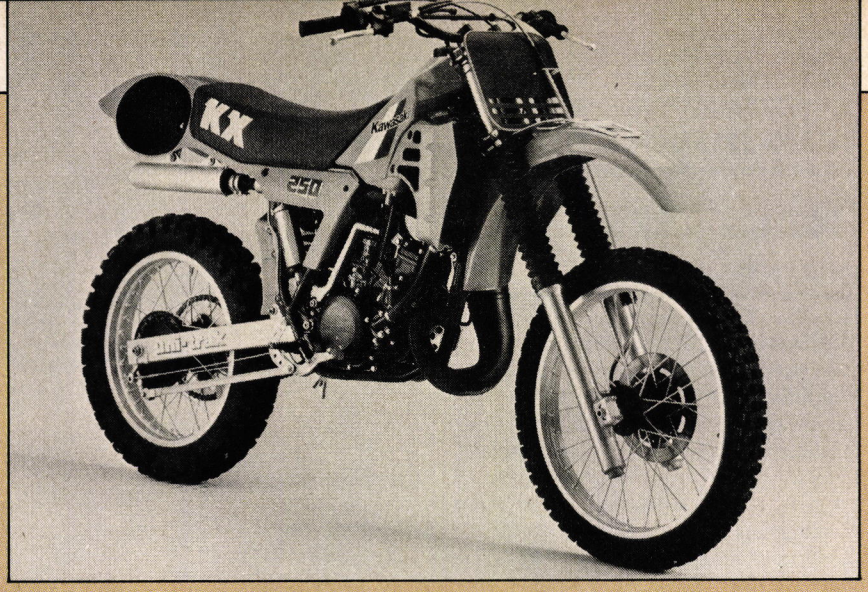
Wheels: Straight-pull spokes and aluminum nipples lace the Kawasaki hubs to DID rims. The front hub is a spool-type that carries a 210mm brake disc. The rear brake is a drum-type with an adjustable aluminum torque link. The KX is the only machine of these four that is equipped with Dunlop tires rather than Bridgestones.

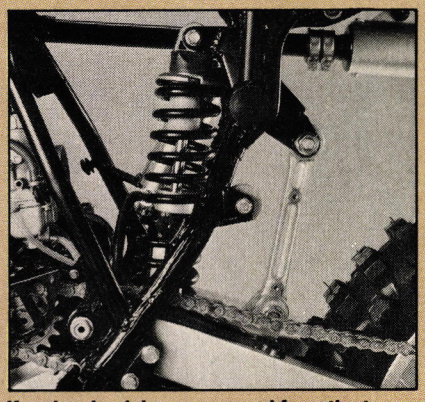
Rear Suspension: In effect, the KX's Uni-Trak single-shock rear suspension operates like an upside-down Honda Pro-Link: The bottom of the Kayaba shock is held stationary while the top is compressed by a rocker arm linked to the swingarm. The linkage gives the Uni-Trak rising-rate springing and damping, although this year the system is less progressive than in '83. The shock still has four rebound damping positions; but this year the compression damping can be altered, as well, by turning a knob on the reservoir to any one of four positions, and spring preload is more easily adjustable than on earlier models. The rear spring rate is unchanged, and Kawasaki still offers optional harder and softer springs.

Front Suspension: Each of the KX's Kayaba fork legs features an improved hydraulic anti-bottoming cone on the damper rod, and a blow-off valve that reduces compression damping during sudden impacts. The valve's blow-off point can be adjusted by turning a screw in the bottom of each fork leg. This year the fork springs are made of a material that is more resistant to sacking-out with use and age. And as with the rear shock, optional softer and harder springs are available.

DETAILS:

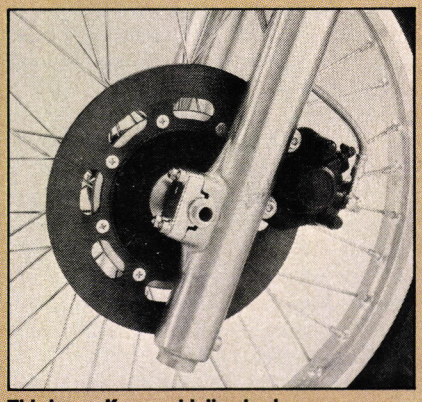
The Kawasaki's seat now extends up the rear of the gas tank to allow the rider to sit farther forward than on previous KXs. The tank is narrower, but it has the same capacity as last year's. The kickstart lever is longer and made of aluminum, and there is an aluminum front fender support. The silencer also is aluminum.





Kayaba shock is compressed from the top

And the Uni-Trak rarely hits bottom.



Third-year Kawasaki disc brake

Honda apparently agrees: It works.

juster that actually changes the compression-damping rate rather than simply altering the point at which damping blow-off occurs. And the ability to change the actual damping rate is highly useful for adjusting the bike to suit differing conditions. On most tracks, the higher damping settings are preferable, although lower positions will suit smoother courses or beginning riders. On the other forks, the difference between blow-off settings is so subtle that in many situations, it can't even be detected.

In contrast, rear-suspension adjustments on some of these bikes can make worlds of difference. On the KX in particular, finding the optimum rear setting is crucial. At first the KX exhibited nasty habits over rough terrain, often lapsing into fishtailing fits and feeling too soft, but never bottoming. The more we increased the shock's preload and rebound damping, though, the better the KX behaved. Eventually, we wound up with the rebound damping on its maximum position, and the preload adjusted so the weight of the rider used about 3.5 inches of rear travel (the other machines worked best set around 4 inches). Kawasaki's engineers deliberately made the Uni-Trak less progressive this year, but perhaps they overshot the mark.

Yamaha took the opposite approach

Tech Inspection:

Suzuki RM250

ENGINE:

Most of the changes in the RM250 engine were directed at smoothing the power delivery and making it more tractable than previous versions. Crankshaft inertia was increased four percent through the use of a larger-diameter crankshaft, necessitating new engine cases. The top end still utilizes six transfer ports, as well as unbridged intake and exhaust ports; but the top of the '84 engine's exhaust port is one millimeter lower, yielding a fractionally higher compression ratio. Carburetion is handled by a 36mm flat-slide Mikuni, which is two millimeters smaller than the similar carb used on the '83 RM—again, to improve the low-end and mid-range power output. That's also the goal of the redesigned exhaust pipe, which now runs on the opposite (right) side of the bike back to a new aluminum silencer.

Drivetrain: The ratios in the RM's five-speed gearbox are unchanged, but the gears now are made of nickel chromoly steel for greater strength. The clutch still uses five fiber drive plates and four steel driven plates.

CHASSIS:

Frame: This year, the RM received an all-new frame, which Suzuki claims is a direct replica of that used on the '83 works outdoor bikes. Most notable of the departures from last year's dimensions are the 1.9-degree-steeper steering head angle (27.8 degrees) and 11mm-shorter front-wheel trail (112mm).

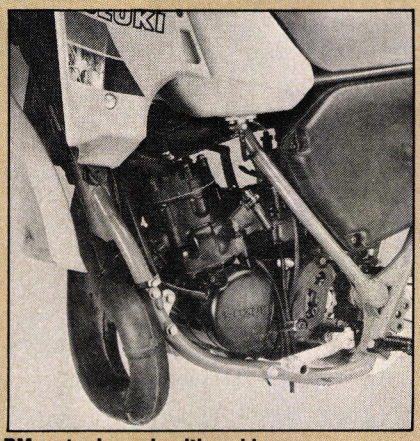
Wheels: Suzuki was the first of the Japanese companies to use straight-pull spokes on its MX bikes, and the '84 RM retains that feature. In fact, aside from the Bridgestone M37 and M38 tires, both wheel assemblies are unchanged this year, including the double-leading-shoe front brake.

Rear Suspension: The RM is the only one of these four that compresses its rear shock from both ends. The bottom of the shock mounts directly to the swingarm, while the top attaches to a large rocker arm that presses down on the shock when the swingarm moves up. The Kayaba shock sits lower in the frame this year to keep both the seat height and the center of gravity low and it's also offset to the right to allow for the largest possible airbox. The shock spring is softer than last year's, and while both rebound and compression damping still can be adjusted externally, the damping rates at each position are lower. Suzuki also reworked the linkage to make the wheel rates less progressive. Thus, the '84 RM is firmer than the '83 on small bumps, but the final segment of travel has roughly the same rate as before.

Front Suspension: Kayaba manufactures the RM's fork, just as it does for the KX and YZ, which is why all three incorporate an adjustable blow-off valve that decreases compression damping at rapid fork speeds. Each full turn of the adjuster screw in the bottom of each of the RM's fork legs changes the blow-off point by four percent. The Suzuki's fork springs are softer than last year's.

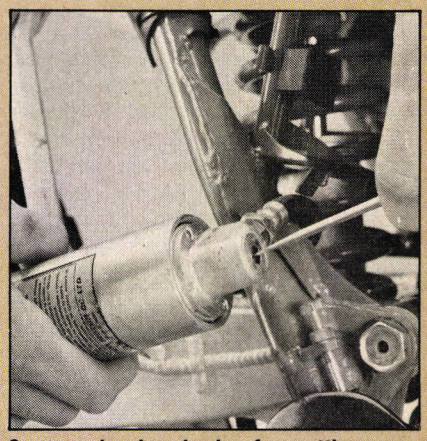
DETAILS:

The complicated, twin-element airbox used on previous RMs has been replaced by a larger box on the left side that incorporates a single, dual-stage element. The new arrangement is less-restrictive and much easier to service. In addition, the RM has a larger fuel tank, bigger numberplates and a longer seat.



RM motor has a healthy midrange

Top and bottom are undernourished.



Compression damping has four settings

As long as you have one screwdriver.

and made the YZ's Monocross rear end *more* progressive than the '83 model. The goal was to make the YZ capable of dealing with all sorts of tracks while requiring very little adjustment; but the Yamaha actually requires the *most* suspension-tinkering of any bike in the group. What works for one track and one rider might not work at all for a different rider on a different track. At its best, which generally is on smoother tracks, the YZ absorbs bumps as well as any of the others, but at its worst, it's the most unpredictable and squirrely of the quartet.

Another factor that affects how well the YZ handles is how hard its rider is trying. When he's cruising at 70-to-80 percent of his ability, the machine's best handling traits are on display. There is never even a trace of a front-end washout or wobble, and turning is just a matter of leaning over and gassing it. When the rider starts trying harder, though, he must really concentrate to keep the front end from washing-out when turning and to stay on his intended lines. But when ridden hard, the Yamaha will turn the fastest lap times of any bike in the group, almost entirely due to its unbelievably torquey power delivery.

The RM is at the other end of the spectrum. Within reason, no matter how hard or how little an RM rider tries, his lap

Continued

Tech Inspection:

Yamaha YZ250

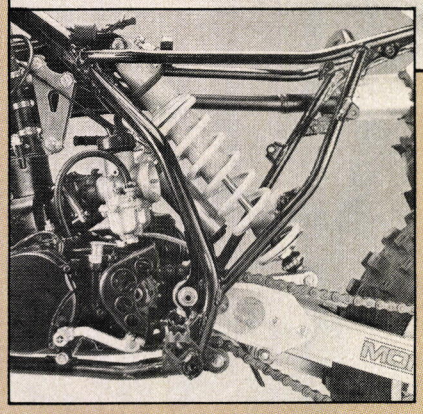
ENGINE:

This is the third year for the Yamaha Power Valve System (YPVS), a mechanism that effectively changes the height of the exhaust port according to engine speed. At high rpm, the port is tallest, benefitting top-end performance; and at lower rpm the port's top edge is lowest, resulting in improved low-end power. This year, however, exhaust-port height at any given rpm is lower than on the '83 YZ250, a change made to improve low-rpm power. Yamaha also has incorporated two auxiliary exhaust ports in the cylinder, one on each side of the main exhaust. The intake port tapers to a smaller port window than on previous models, and the port has a passage connecting it only to the right-side transfer port. The YZ250 also has a new exhaust pipe with an aluminum silencer, a more advanced ignition curve and a sturdier head stay that uses two brackets instead of one.

Drivetrain: Within the YZ's five-speed gearbox, the ratios for third, fourth and fifth are lower (numerically higher) than on last year's model, resulting in a closer-ratio gearbox. The construction of the rest of the transmission and driveline is unchanged, including the clutch and shifting mechanism.

CHASSIS:

Frame: The YZ's frame was refined this year to increase durability. The fork stops now are welded on both sides of the steering head and double as gussets to prevent the cracking that occurred on some '83 YZs. Some frame tubes are of larger diameter, such as the crossmember that runs transversely under the rear motor-mount. And a brace has been added to support the left radiator in the event it hits the ground in a get-off. On the right side, Yamaha figures, the exhaust pipe serves a similar function. The engine and swingarm both were moved back 3.5mm on the '84 YZ to achieve a more rearward weight bias, although that change also resulted in a small increase in wheelbase.



Yamaha shock is the easiest to adjust

And needs to be adjusted most often.

Wheels: Yamaha's response to straight-pull spokes is the Z-spoke, a single spoke that does the work of two. Each spoke is long enough to span almost the full inside diameter of the rim, is threaded at both ends, and is bent in a Z-shape in the middle where it fits into the hub. Yamaha claims this system allows greater spoke tension with less chance of the spokes loosening or breaking. The Z-spoke system is used on both sides of the front wheel and on the right side of the rear.

Rear Suspension: Like the other rear suspension systems on these 250s, Yamaha's consists of a single shock compressed at an ever-increasing rate by a linkage connected to the swingarm. Unlike the others, though, the Yamaha's shock is canted forward, which allows for a longer shock. This year, however, the shock's stroke is 6mm shorter than the '83 YZ's, even though the wheel travel is unchanged. This is because the linkage has been altered to make the system more progressive, starting at a lower wheel rate than on last year's bike and progressing to become stiffer than in the last inches of travel. The shock's compression-damping adjuster has been moved from the shock body to the reservoir so adjustments can be made without removing the tank and seat. And internally, the shock piston uses a new type of sealing ring that is claimed to reduce shock fade.

Front Suspension: The YZ's Kayaba fork incorporates an adjustable blow-off valve (like those on the KX and RM) that reduces the damping during rapid fork compression. This year, the 43mm fork stanchions are 5mm closer together, according to Yamaha, for greater rigidity. Optional springs are available.

DETAILS:

The YZ has undergone minor cosmetic surgery, receiving a new fuel tank and more securely mounted radiator scoops in the process. The seat still extends over the fuel tank, but this year it has a stronger base. The numberplates are made of a more flexible material, and the side-access airbox is larger and less restrictive than last year's.

times are the most consistent. As our test riders got off the Suzuki, they always commented on how fast they *felt*; and there's no question that the RM *does* inspire confidence. It turns quickly and with little effort, and it will hug an inside line or smash a berm with equal competence. On rare occasions the front end shakes on sharp stutter-bumps, but otherwise the Suzuki is perfectly stable.

Of course, one reason the RM had such agreeable manners might be traced to the fact that, according to the stopwatch, at least, it was going slower than the others. Not much slower, but about a second off the pace, whether ridden by an expert or an amateur. Some test riders found that the RM was able to turn better lap times than the other three bikes at the end of a long, gruelling moto; but between the RM's need for constant clutch-fanning and its stiff clutch-pull, other riders actually faded more quickly on the Suzuki.

Turning consistent lap times on the KX, however, was difficult for *all* the riders. Throughout the test, the Kawasaki was wildly inconsistent in its lap times, usually being either very fast or very slow, and seldom in the middle. Some tracks just suited the KX and some didn't. Through smooth, sweeping turns, the Kawasaki handled better than any of the others, and on difficult, off-camber terrain the KX's smooth power delivery made the bike easy to handle. But the KX also is the most unstable of the lot.

Although the front end rarely shakes, the bike is reluctant to hold a straight line on rough tracks. And even on smooth tracks, the KX's times would vary greatly, usually depending on what line the *bike* — not the rider—decided to take.

On the other hand, lap times for the Honda were extremely consistent. In fact, the CR usually was as consistent as the RM, only quicker. The Honda recorded the quickest lap times most often, and unlike the Yamaha, its rider always felt like he was under control. The Honda excels in tight turns, and for that matter, in all turns. The only fault in the Honda's handling comes on faster tracks, where the front end has an almost constant shake. This never becomes a problem or costs time, but it is noticeable.

All of the bikes had little pluses and minuses like that, characteristics that aren't necessarily reflected in their lap times. For instance, the Honda's rear brake requires more pedal-pressure than any of the others do, while its front brake is the strongest. And several riders complained that the Kawasaki's uncomfortably shaped rear fender was constantly pounding their backsides. KX riders also were annoyed by the grabby clutch, which is better than last year's but still not as good as the others. While racing hard on the Suzuki, the riders continually found their feet being wiped off the pegs in deep ruts and berms.

Factors like that aren't major considerations when it comes to buying a bike, but they take on a greater importance in a comparison this close. Each of these bikes is a winner in its own right, and collectively they are a high-water mark for motocross in general. As proof that motocross bikes have never been so good, look at the Kawasaki, which, if available last year, would have been the absolute best 250 you could buy. But the standards have been elevated so dramatically that the KX only gets fourth place in our overall standings. Third is the Suzuki, a bike flawed only by a slight horsepower disadvantage. And second goes to Yamaha, with its low-end torque advantage. The winner, as dictated by the stopwatch and by a seeming absence of vices, is the Honda, the bike most likely to net you the highest finishes most consistently on the widest variety of racetracks.

There are, of course, other ways to rank these 250s. We could point out that the Kawasaki perhaps is the best choice for the Novice, that the Suzuki is an Intermediate's dream, and that a Pro will be able to extract the most from the YZ. Or we could say that the proximity of a dealership and the availability of some kind of support are the most important factors. But if you evaluate these four machines strictly on their own merits as racebikes and nothing else, the Honda consistently comes out on top. And consistency is what wins even the closest races. —*Ron Lawson* •

Honda CR250R

Nits
1. Shock reservoir insecurely mounted.
2. Seat must be removed for air-filter service.

Picks
1. Large easily grasped gas cap.
2. Grips are soft and comfortable.

Kawasaki KX250

Nits
1. Side numberplates are small.
2. Brake reservoir shape limits lever positioning.
3. Shock difficult to adjust.

Picks
1. Grips are soft and comfortable.
2. Grease fittings allow easy shock-linkage lubrication.
3. Narrow, well tucked-in fuel tank.

Suzuki RM250

Nits
1. Exhaust pipe is poorly tucked-in.
2. Mud-flap protecting shock can break.
3. Seat hard at rear.
4. Shock difficult to adjust.

Picks
1. Fork leg protectors are standard.
2. Numberplates are large.

Yamaha YZ250

Nits
1. Hard to shift under acceleration.
2. Grips are poorly shaped.
3. Slots restrict usable area of front numberplate.

Picks
1. Shock preload and damping are easily adjusted.
2. Grease fittings allow easy shock-linkage lubrication.

Ride Review

• This is going to sound like a cop-out, but for me, there is no clear-cut winner here. On any given track, one of these 250s would be my first choice, but it wouldn't always be the *same* 250.

For long motos on brutally rough tracks, for instance, I'd want the Suzuki under me. It eats up bone-jarring terrain better than the others, and I find it the easiest and least-tiring to ride. It's not the fastest, but horsepower isn't the answer on that kind of track. It *is* the answer on smoother courses, though, which is why I'd want the Yamaha if the motos were short and the track not so bumpy. The YZ's ability to rocket out of turns like an Open-classer can be a distinct advantage under those circumstances. And on tight, twisty tracks, where power takes a backseat to agility, the Kawasaki's light feel and instant response are the hot tip.

Which brings us to the Honda, whose specialty is *not* having a specialty. The CR offers no big advantages under any circumstances, but neither does it have any significant disadvantages, always working about as well as—if not better than—the others under *every* circumstance. That's why, if I had to buy just one of these bikes, I'd probably pick the Honda. But if I had my druthers, I'd simply keep all four. —*Paul Dean*

• Picking Suzuki's new RM250 as my favorite is a little like dating a finalist in a beauty contest when I could have gone out with the winner. But while I concede that Honda's CR250R is the undisputed winner here, the RM has a definite appeal that I can't ignore.

I know that my choice is out-motored by the other three. Two of the others have better front brakes. I'll even admit that my feet sometimes get wiped off the RM's footpegs. But all those shortcomings combined don't outweigh the good feeling I get whenever I ride the RM. Put simply, the bike just feels right.

For a start, the riding position is comfortable during the longest ride. Combine that with the most precise steering and, in my view, the best suspension of the bunch and even long motos don't *seem* long. All right, keeping the motor in the powerband does take plenty of clutch-fanning, but unlike the Yamaha's always-on-the-powerband motor, the Suzuki engine never got me into trouble. Similarly, the RM's brakes never inadvertently locked a wheel like the Kawasaki's and Honda's did. All those little points helped me fall in love with the new RM. Now, if I can get a dyno doctor to perform minor surgery on this beauty, I won't feel guilty about standing up the winner. —*David Dewhurst*

Continued

CYCLE GUIDE SPECIFICATIONS

Honda CR250R

IMPORTER: American Honda Motor Company Inc.
100 West Alondra Boulevard, Gardena, California 90247

SUGGESTED RETAIL PRICE: $2418

ENGINE

Type	liquid-cooled two-stroke vertical single
Port arrangement	one reed-valve-controlled intake, four main transfers, one booster transfer, one exhaust
Bore and stroke	66.0mm x 72.0mm
Displacement	246.3cc
Compression ratio (corrected)	8.6:1
Carburetion	one 36mm Keihin slide/needle
Air filter	washable oiled foam element
Lubrication	pre-mixed fuel and oil
Starting system	primary kick
Ignition	flywheel-magneto CDI
Charging system	none

DRIVETRAIN

Primary drive	straight-cut gears; 3.000:1 ratio
Clutch	wet, multi-plate
Final drive	#520 chain (⅝-in. pitch, ¼-in. width); 3.643:1 (51/14) ratio

Gear	Internal gear ratio	Overall gear ratio	MPH per 1000 RPM
I	1.800	19.671	3.99
II	1.470	16.065	4.89
III	1.210	13.224	5.94
IV	1.000	10.929	7.19
V	0.833	9.103	8.63

SUSPENSION/WHEEL TRAVEL

Front	Showa air-spring, 43mm stanchion tube diameter, 14-position adjustable compression damping/11.7 in. (298mm)
Rear	single Showa shock, 17-position adjustable compression damping, 22-position adjustable rebound damping, 18mm spring preload range/12.2 in. (309mm)

BRAKES

Front	single-action hydraulic caliper, 9.3 in. (236mm) effective disc diameter
Rear	drum, single-leading shoe, straight-pull cable-operated

TIRES

Front	90/90-21 Bridgestone Motocross M37
Rear	130/80-18 Bridgestone Motocross M38

DIMENSIONS AND CAPACITIES

Weight	216 lbs. (98.0kg)
Weight distribution	48.4% front, 51.6% rear
Wheelbase	57.8 to 59.2 in. (1467 to 1504mm)
Seat height	37.7 in. (958mm)
Handlebar width	31.7 in. (805mm)
Footpeg height	16.9 in. (428mm)
Ground clearance	13.4 in. (339mm), at engine cradle
Steering head angle	26.7 degrees from vertical
Front wheel trail	4.13 in. (105mm)
Frame	tubular chromoly steel, single front downtube
Fuel tank	plastic, 2.4 gal. (9.0/), no reserve
Instrumentation	none

PERFORMANCE

Top speed (observed)	79 mph (127 km/h)

WARRANTY: none

AVAILABLE COLOR: red only

Kawasaki KX250

Kawasaki Motors Corporation
2001 East Edinger Avenue, Santa Ana, California 92711

$2299

ENGINE

Type	liquid-cooled two-stroke vertical single
Port arrangement	one reed-valve-controlled intake, four main transfers, one booster transfer, one main exhaust, two booster exhausts
Bore and stroke	70.0mm x 64.9mm
Displacement	249.8cc
Compression ratio (corrected)	9.1:1
Carburetion	one 38mm Mikuni slide/needle
Air filter	two-stage washable oiled foam element
Lubrication	pre-mixed fuel and oil
Starting system	primary kick
Ignition	flywheel-magneto CDI
Charging system	none

DRIVETRAIN

Primary drive	straight-cut gears; 2.750:1 ratio
Clutch	wet, multi-plate
Final drive	#520 chain (⅝-in. pitch, ¼-in. width); 3.571:1 (50/14) ratio

Gear	Internal gear ratio	Overall gear ratio	MPH per 1000 RPM
I	2.133	20.952	3.74
II	1.765	17.332	4.52
III	1.389	13.641	5.74
IV	1.136	11.161	7.02
V	1.000	9.821	7.98

SUSPENSION/WHEEL TRAVEL

Front	Kayaba air-spring, 43mm stanchion tube diameter, 8-position adjustable compression-damping blow-off valve/11.6 in. (294mm)
Rear	single Kayaba shock, 4-position adjustable compression damping, 4-position adjustable rebound damping, 18mm spring preload range/12.3 in. (313mm)

BRAKES

Front	single-action hydraulic caliper, 9.4-in. (238mm) effective disc diameter
Rear	drum, single-leading shoe, straight-pull cable-operated

TIRES

Front	3.00-21 Dunlop Sports K790
Rear	5.10-18 Dunlop Sports K790

DIMENSIONS AND CAPACITIES

Weight	220 lbs. (99.8kg)
Weight distribution	48.2% front, 51.8% rear
Wheelbase	57.7 to 59.1 in. (1466 to 1500mm)
Seat height	37.9 in. (963mm)
Handlebar width	32.5 in. (825mm)
Footpeg height	17.1 in. (433mm)
Ground clearance	13.1 in. (333mm), at engine cradle
Steering head angle	28.5 degrees from vertical
Front wheel trail	4.65 in. (118mm)
Frame	tubular chromoly steel, single front downtube
Fuel tank	plastic, 2.0 gal. (7.5/), no reserve
Instrumentation	none

PERFORMANCE

Top speed (observed)	71 mph (114 km/h)

WARRANTY: none

AVAILABLE COLOR: green only

Suzuki RM250

U.S. Suzuki Motor Corporation
3251 East Imperial Highway, Brea, California 92621

$2399

Type ..... liquid-cooled two-stroke vertical single
Port arrangement ..... one reed-valve-controlled intake, six transfers, one exhaust
Bore and stroke ..... 70.0mm x 64.0mm
Displacement 246.3cc
Compression ratio (corrected) 8.5:1
Carburetion ..... one 36mm Mikuni rectangular-slide/needle
Air filter ..... two-stage washable oiled foam element
Lubrication ..... pre-mixed fuel and oil
Starting system ..... primary kick
Ignition ..... internal-rotor magneto CDI
Charging system ..... none

Primary drive ..... straight-cut gears; 2.565:1 ratio
Clutch ..... wet, multi-plate
Final drive ..... #520 chain (5/8-in. pitch, 1/4-in. width); 3.571:1 (50/14) ratio

Gear	Internal gear ratio	Overall gear ratio	MPH per 1000 RPM
I	2.077	19.028	4.08
II	1.722	15.778	4.92
III	1.381	12.652	6.13
IV	1.174	10.756	7.21
V	1.000	9.161	8.47

Front ..... Kayaba air-spring, 43mm stanchion tube diameter, 8-position adjustable compression-damping blow-off valve/11.8 in. (300mm)
Rear ..... single Kayaba shock, 4-position adjustable compression damping, 4-position adjustable rebound damping, 16mm spring preload range/12.9 in. (327mm)

Front ..... drum, double-leading shoe
Rear ..... drum, single-leading shoe, straight-pull cable-operated

Front ..... 100/80-21 Bridgestone Motocross M37
Rear ..... 130/80-18 Bridgestone Motocross M38

Weight ..... 220 lbs. (99.8kg)
Weight distribution ..... 47.9% front, 52.1% rear
Wheelbase ..... 57.7 to 58.9 in. (1466 to 1498mm)
Seat height ..... 37.4 in. (951mm)
Handlebar width ..... 31.5 in. (800mm)
Footpeg height ..... 17.4 in. (442mm)
Ground clearance ..... 12.7 in. (322mm), at lower shock mount
Steering head angle ..... 27.8 degrees from vertical
Front wheel trail ..... 4.41 in. (112mm)
Frame ..... tubular chromoly steel, single front downtube
Fuel tank ..... plastic, 2.5 gal (9.5*l*), no reserve
Instrumentation ..... none

Top speed (observed) ..... 74 mph (119 km/h)

none

yellow only

Yamaha YZ250

Yamaha Motor Corporation USA
6555 Katella Avenue, Cypress, California 90630

$2429

Type ..... liquid-cooled two-stroke vertical single
Port arrangement ..... one reed-valve-controlled intake, four main transfers, one booster transfer, one variable-height main exhaust, two booster exhausts
Bore and stroke ..... 68.0mm x 68.0mm
Displacement 247.0cc
Compression ratio (corrected) ..... variable from 7.8:1 to 9.5:1
Carburetion ..... one 38mm Mikuni slide/needle
Air filter ..... two-stage washable oiled foam element
Lubrication ..... pre-mixed fuel and oil
Starting system ..... primary kick
Ignition ..... internal-rotor magneto CDI
Charging system ..... none

Primary drive ..... straight-cut gears; 2.625:1 ratio
Clutch ..... wet, multi-plate
Final drive ..... #520 chain (5/8-in. pitch, 1/4-in. width); 3.692:1 (48/13) ratio

Gear	Internal gear ratio	Overall gear ratio	MPH per 1000 RPM
I	2.143	20.769	3.75
II	1.750	16.962	4.60
III	1.444	14.000	5.57
IV	1.200	11.631	6.70
V	1.000	9.692	8.04

Front ..... Kayaba air-spring, 43mm stanchion tube diameter, compression-damping blow-off valve infinitely variable within 8 turns of adjuster/11.3 in. (287mm)
Rear ..... single Yamaha shock, 21-position adjustable compression damping, 20-position adjustable rebound damping, 30mm spring preload range/12.6 in. (319mm)

Front ..... drum, double-leading shoe
Rear ..... drum, single-leading shoe, straight-pull cable-operated

Front ..... 90/90-21 Bridgestone Motocross M37
Rear ..... 130/80-18 Bridgestone Motocross M38

Weight ..... 214 lbs. (97.1kg)
Weight distribution ..... 48.4% front, 51.6% rear
Wheelbase ..... 57.4 to 58.4 in. (1458 to 1484mm)
Seat height ..... 37.2 in. (946mm)
Handlebar width ..... 31.9 in. (810mm)
Footpeg height ..... 17.3 in. (439mm)
Ground clearance ..... 13.7 in. (348mm), at engine cradle
Steering head angle ..... 28.0 degrees from vertical
Front wheel trail ..... 4.69 in. (119mm)
Frame ..... tubular chromoly steel, single front downtube
Fuel tank ..... plastic, 2.4 gal (9.0*l*), no reserve
Instrumentation ..... none

Top speed (observed) ..... 72 mph (116 km/h)

30 days on engine, frame, rear shock and swingarm only

yellow only

All weight and measurements are taken with machine unladen and fuel tank empty.

"50,000 miles. We made it, all three of us."

When you lend Bob and Patti Carpenter of *Road Rider* Magazine a brand-new touring motorcycle and say, "test it," you'd better not be needing it back right away.

They might take it to Alaska.

Or Florida.

Or Newfoundland.

Before you see it again, they might ride it to every state in the Union save Hawaii. And all 12 Canadian provinces for good measure.

Which is exactly what they did.

After six months and more than 50,000 miles, they finally brought back our Venture. As thoroughly tested as any two-wheeler in the history of touring. (That's it just above, after a wash-and-polish.)

So what was their verdict?

As Bob wrote, "...the Yamaha Venture proved itself beyond any doubt to be a magnificent two-up touring platform."

For one thing, or rather two things, they liked its orthopedically designed seat.

"Even on the harsh, unpaved roads of northern Canada, or the pothole-ridden thoroughfares of the northeastern U.S., the seating arrangement gave us the necessary support and kept us feeling good—literally—throughout the trip."

Another thing that felt good to them was the way it handled.

"It was a joy to ride through the corners, not a chore."

And, on the straights, "High-speed wallowing and deceleration wobble—common phenomena on many heavyweights when loaded for touring—were never experienced."

In short, "The Venture has to be the most forgiving, most agile member of the over-700-pound fraternity."

The way its 1200cc, 16-valve,

2-year/24,000 mile warranty. Warranty terms are limited. See your Yamaha dealer for details.

(Accessories—1-year warranty.) Always wear a helmet and eye protection.

liquid-cooled, V-4 supplies the motion also drew praise.

"...its performance is nothing short of phenomenal. Acceleration is surprisingly smooth and even — small manipulations of the throttle result in large momentum changes."

Now for the question that's on everybody's mind. How did the bike hold up on such a long trip?

Said Bob, "...there were a few glitches along the way...But these proved to be insignificant concerns when compared with the overall excellence of the Venture's design and function."

He went on to say, "The bike never lost its zip. Passing, pulling hills, or running in pure unashamed defiance of the speed laws were just as possible at the end as they were at the beginning."

And concluded, "...neither Patti nor I would hesitate to change the oil and plugs and take off again for another 50,000 miles."

Umm, sure. Swell idea, Bob. We'll let you know.

YAMAHA

Built for the fun of it.™

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It's tough in the rough but easy on you, with handling you've got to get your hands on.

Only Nissan gives you this unique combination of features for muscle and control:

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- *Wide-Clearance independent front suspension steps over rough stuff instead of bouncing like solid axles.*
- *Twin A-arms clear obstacles with the highest minimum ground clearance of any compact truck.*
- *Stabilizer bar limits roll; standard power steering responds instantly in tight spots.*
- *Rugged double-wall cargo bed; tailgate lowers 90°, 180°, and is removable.*
- *3-across seating in Deluxe and Long Bed.*

See the full line of Nissan 4 x 4's, including the Sport Truck and King Cab® (shown), a Nissan innovation.

Nissan 4 x 4: one tough hunk that's easy to handle—and to buy.

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MAJOR MOTION FROM NISSAN

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SPORT LINES

Cycle Guide's True Tales of Race Courses, Dark Horses and Machines at Speed

EDITED BY DAIN GINGERELLI

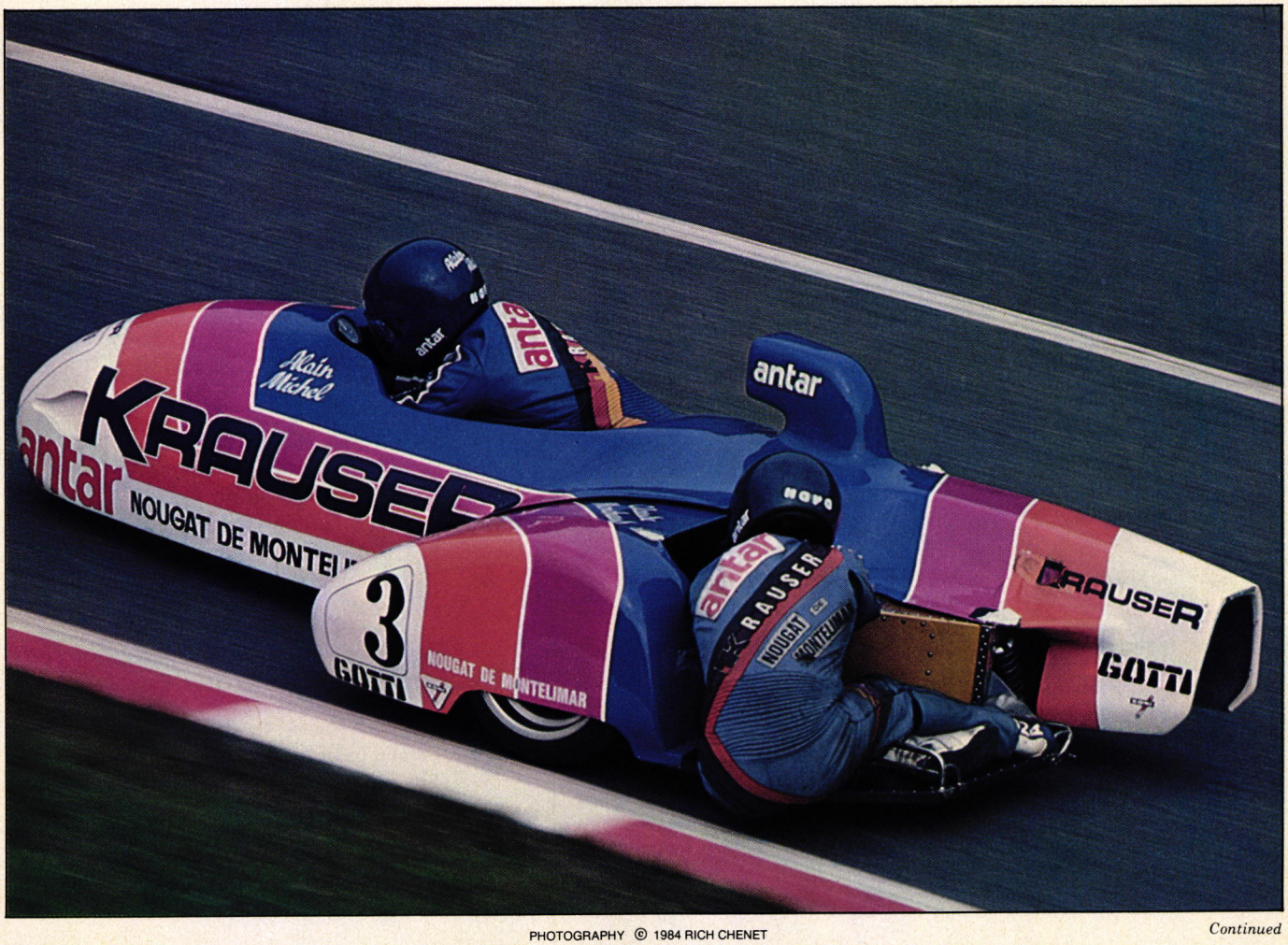
Rebel Racers

The third-wheel revolution.

• Mention rear engines, monocoque chassis and ground-effects to a motorcycle racer and he's liable to look at you like the RCA Victor dog—unless, of course, you're talking to a *sidecar* racer. During the past decade, designers have let their imaginations and drafting pencils explore new engineering frontiers, resulting in sidecars that resemble little more than three-wheeled Formula cars. A design revolution, begun almost 10 years ago, still flourishes, one that detractors say moves sidecar competition far from true motorcycle racing.

But sidecars always have been looked upon by the two-wheel sect as motorcycling's outcasts. For instance, when the kneeler sidecar was introduced in the early Sixties, solo riders frowned; who would ride a motorcycle while propped on his knees? Sidecar people, obviously; and with the kneeler the techno-revolution really began, led by designers such as Louis Christen. It was almost by accident that Christen got involved, because he was originally an automobile racer and designer. But when Christen ran out of money in 1975, his car-racing program ran out of gas. Christen was stalled on the sidelines, a place any racer hates to be.

Then a friend, a sidecar racer, asked

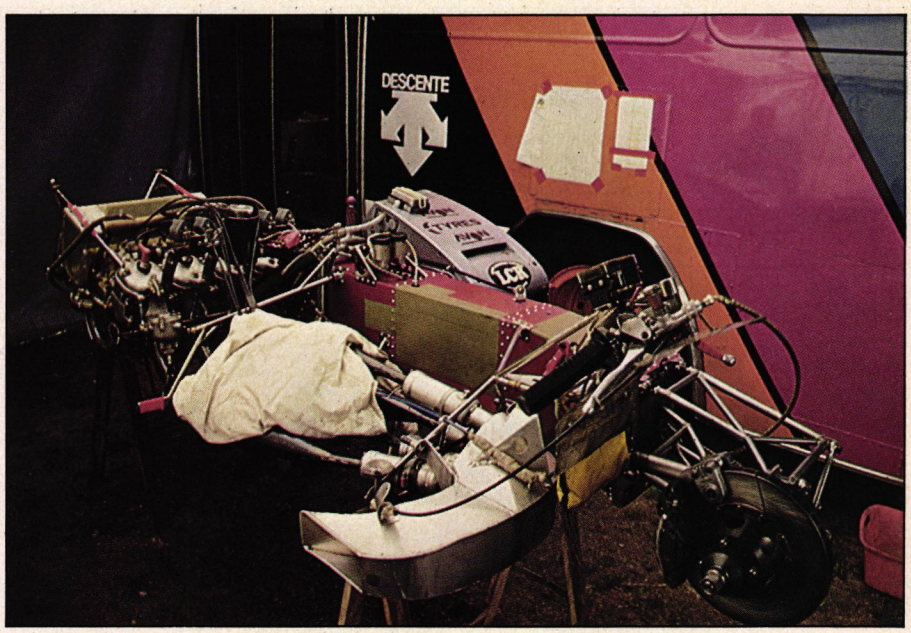


PHOTOGRAPHY © 1984 RICH CHENET

Continued

A sidecar becomes a motorcycle

By lifting its third wheel.



Sidecar exposed: riveted aluminum and rear engine

The technology is similar to what you'd find in a race car.

Christen to design a sidecar rig. Realizing the potential similarities of sidecars and cars, Christen went ahead with the project, even though at that point he had never even seen a sidecar race. Nonetheless, his rig won its first race, and Christen was on his way.

That first rig had a monocoque chassis, a design that was then only just gaining acceptance in sidecar racing.

Soon virtually every sidecar designer was using a monocoque chassis. Almost overnight, technology became the central factor in sidecar racing. More innovation followed, including the use of rear engine placement for better traction, and sleek body panels that made sidecars look more like GT racing cars than motorcycles with passenger pods. The sidecar techno-explosion even

THE QUICKEST WAY T

You are what you ride...and known by the company you keep. So make it the best. Kawasaki. GPz750. The street-legal version of the Superbike that just captured Kawasaki's third consecutive Superbike Championship. GPz1100. Tied (co-winner) with Kawasaki's 750 Turbo in Cycle Guide's "fastest production motorcycle" showdown. This is the high in high-performance. GPz550. King of American amateur road racing. This is a hard bike to

GP

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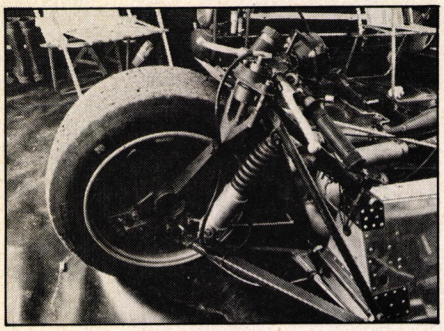
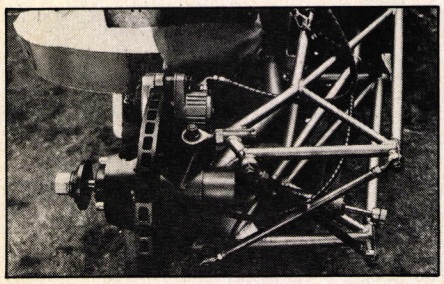
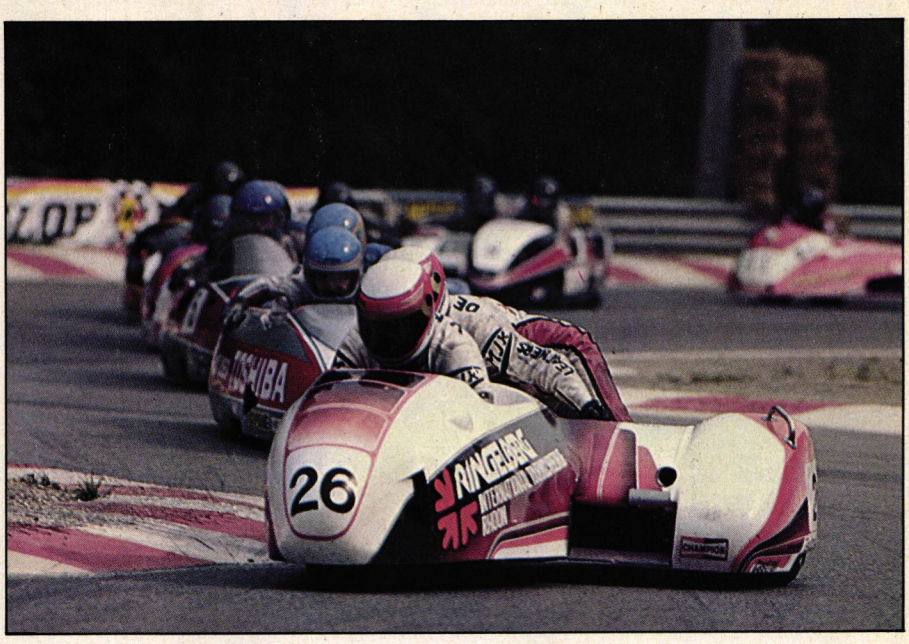




Steering systems are unusual

Similar to those on Formula race cars.



A swarm of sidecars files through a chicane at the Assen TT

Looking like colorful, asymmetrical sports cars.

led to a short-lived flirtation with *steerable* third wheels.

Christen was at the forefront of that technological revolution, and adapted still more ideas from automobile engineering: Airfoils, wings, ground-effects side skirts, even the wide, ultra-low-profile tires used on the Tyrell six-wheel Formula 1 car of the Seventies were tried on his sidecars. The Tyrell-tire sidecar proved to be a temporary setback to Christen's successes, however. "Its aerodynamics worked better than most sidecars," he said, "and in a straight line it was one of the fastest cars I had ever built. But its handling was bad."

For the past couple of years, Christen has spent less time experimenting, and instead has concentrated on building what he con-

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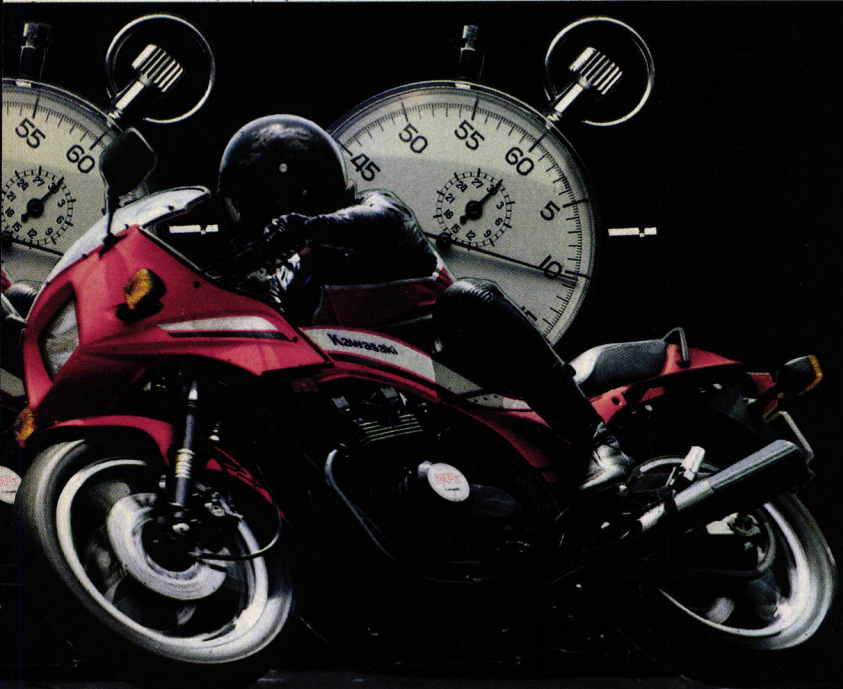

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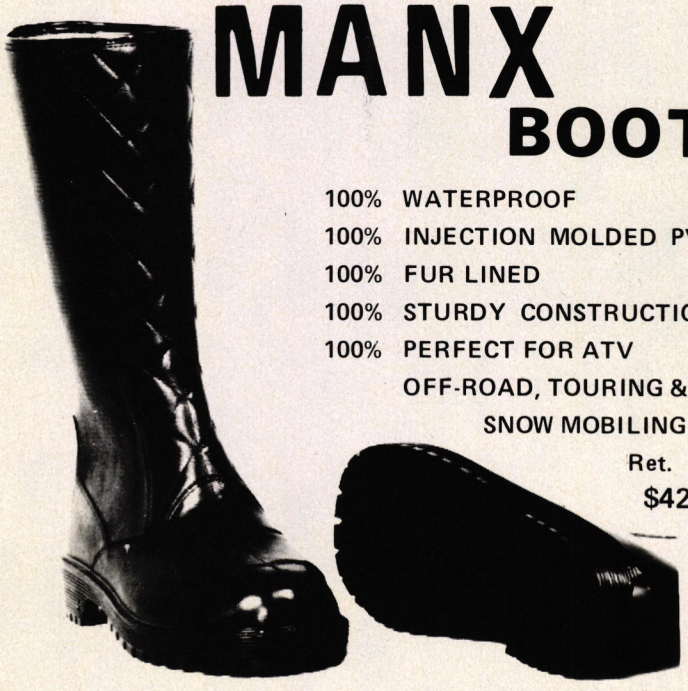

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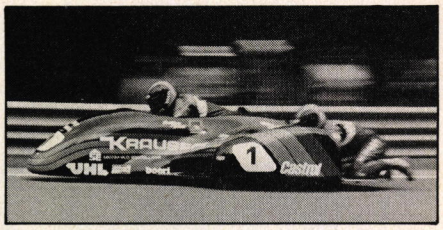
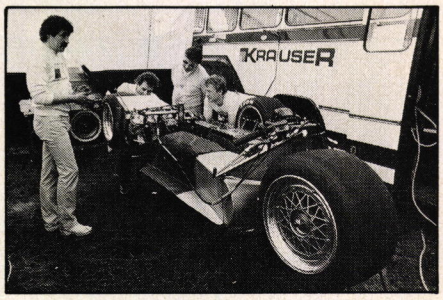


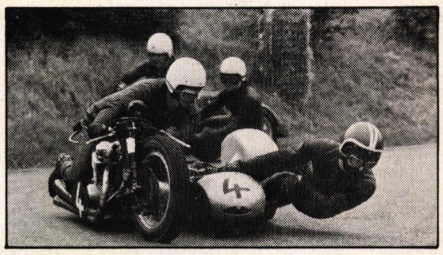
The monkey hangs on down the straight

Tucked in, to break wind.



Downtime in the Grand Prix paddock

Exposing the monocoque chassis.



English sidecars of the early Seventies

When sidecars bolted to motorcycles.

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A Sixties-vintage BMW hack

Of the pudding-bowl-helmet era.

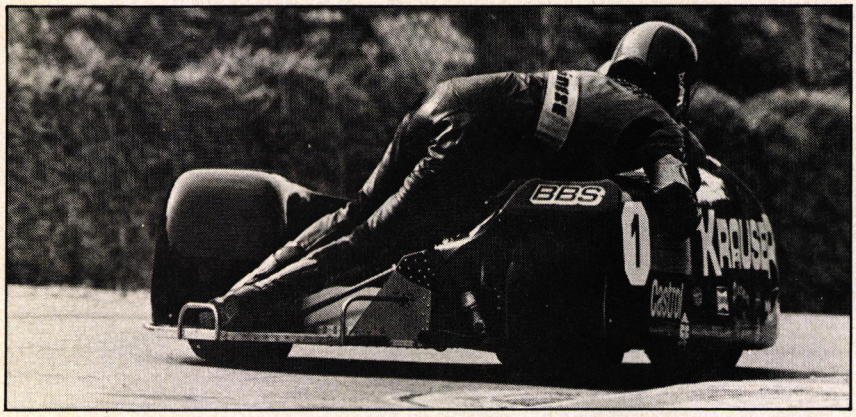
© 1984 DAVID DEWHURST

siders good, reliable chassis. Most of the racers accept his definition of reliability, and more than half of the GP field, including current World Champion Rolf Biland, also of Switzerland, use Christen sidecars.

But although Biland has tried many of Christen's varied speed-tricks, Biland contends that the main reason he runs a Christen rig is that it doesn't flex when cornering. And for 1983, Biland used a year-old Christen chassis that he had already sorted out, to win his third world championship.

Recently, Biland has expressed interest in automobile racing, too, and even made his debut last year in a March Formula 2 racer. And if his departure to car racing is permanent, the move could make a certain amount of sense. After all, the revolution will continue, and perhaps the next logical step for sidecar racers could be the addition of a fourth wheel. —*Dain Gingerelli*

The Sidecar Hang-Out



The passenger stretches across the driver's seat to set up for a right turn

No free rides here; by balancing the rig, he pays his fare.

• When sidecar passengers talk about hanging out at the racetrack, they mean more than just rubbing elbows with their heroes in the paddock. They're talking about *racing*: When a sidecar passenger hangs out, he's doing so to stabilize the rig and help keep it from either sliding or tipping over in a turn.

Because sidecars tend to misbehave in those ways during cornering, it's necessary for the passenger—or monkey, as he's nicknamed—to move from one side of the car to the other, depending on the turn; for right-hand turns, the monkey hangs out to the right, and left for left-handers. In that way, he helps balance the rig so that it doesn't flip or lose traction and slide.

Passenger-duty also serves as a stepping stone to becoming a sidecar *driver*. World Champion Rolf Biland spent two years in apprenticeship as a monkey, just as 21-year-old Geral De Haas is doing now. De Haas has raced for four seasons in the co-pilot's chair, and wants eventually to graduate to the driver's seat. Perhaps his most important lesson, so far, has been in hanging *on*: De Haas fell off once, and broke both arms.

Other passengers, such as Julia Bingham, are content to remain in the co-driver's role. She's been a passenger for 10 years, and wouldn't trade her seat at the racetrack for anything. "Driving," she said, "would be boring."

But Bingham's devotion to the passenger's role isn't universally shared. Riding shotgun in a sidecar is a demanding occupation, and the turnover, so to speak, among passengers is high. Even Biland, who is considered to be one of the safest, most consistent GP drivers, has a difficult time keeping his hired hands around for more than three seasons: He's had seven monkeys since 1971. As one passenger put it, "The day you feel fear is the day when you should hang up your leathers." And judging by the changeover record, there must be plenty of passenger's leathers hanging idle in closets. —*Dain Gingerelli*

Continued

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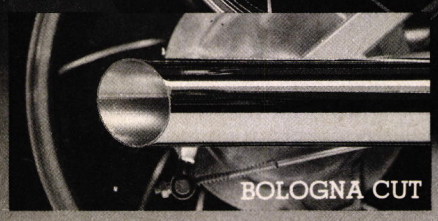

Jardine announces a new staggered-dual exhaust system for the Yamaha Virago and XV920. Available in either tapered end or bologna cut styles, the new pipes feature the mellow throatiness that you can only get from a big V-twin. In addition, you get the extra Jardine punch that'll stir your blood. Turn on your Yamaha now and turn a few heads—with Jardine.

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SUPERBIKERS:

Lawson Lands a Win

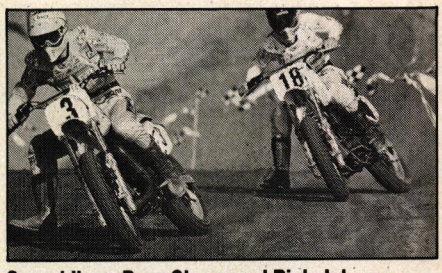
The new Mr. Superbikers.

• Eddie Lawson proved a point at Carlsbad last November: You don't have to be a motocross racer to win the ABC Superbikers race.

Lawson, a roadracer by trade, handily won the 10-lap race around the asphalt-and dirt-course, while last year's winner, MXer Danny Chandler, finished second. The top five finishers included three other motocross racers, though, indicating that while Lawson might have proven his point, the decision could just as well have gone in favor of the MXers—for the fifth time in a row.

But while Lawson broke the four-year string of victories by motocross riders at the Superbikers event, he left the established order of mechanical prerequisites unchanged. His bike, like the majority of bikes entered, was a converted motocross racer, a Yamaha YZ490 to be specific.

The standard conversion for Superbiker machinery is pretty straightforward. Conical drum brakes and knobby tires are replaced with discs and flattrack or rain-grooved roadrace tires. Other modifications might be included, but the primary objective is to adapt the berm-busting bikes to the high-speed asphalt portion of Carlsbad.



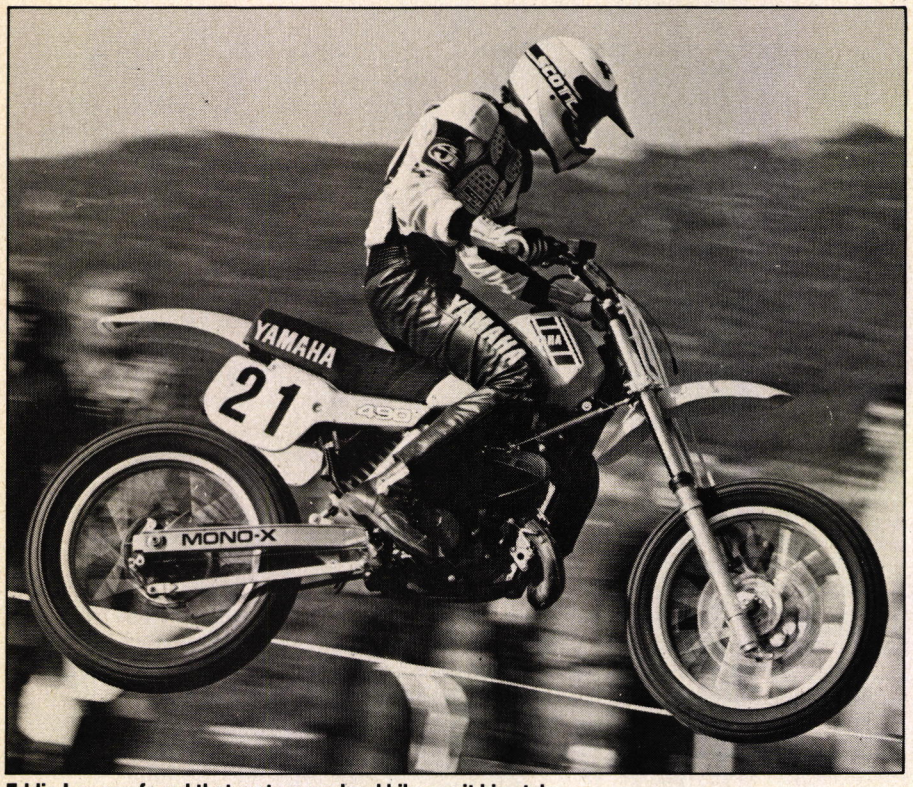
Superbikers Broc Glover and Rick Johnson

Two-stroke vs. four-stroke here.

Danny Chandler slides his Honda CR500

Sandwiched between two Europeans.

Those hybrids work, too, and every year since Kent Howerton won the first Superbikers in 1979, a converted motocross bike has beaten everything else brought to



PHOTOGRAPHY © 1984 DAVID DEWHURST

Eddie Lawson found that motocross-bred bikes suit his style

From the moment the green flag dropped, he was the man to beat.

Wayne Rainey on a Kawasaki Superbiker bike

Mechanical trouble sidelined him.

Carlsbad. That list includes hefty vee-twin Harley-Davidson XR750s and large-bore four-stroke singles.

Still, the determining factor in winning against a field of 11 other national and international champions is how hard a Superbikers rider is willing to ride his hot-rodded machine through the corners. And when you consider that riders such as Lawson and two-time Superbikers winner Steve Wise slide and drift their bikes on the pavement as well as the dirt, the ante is high, indeed. As far as Lawson is concerned, though, the roadracers have enough chips to remain in the game. —*Dain Gingerelli*

Continued

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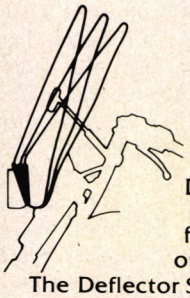

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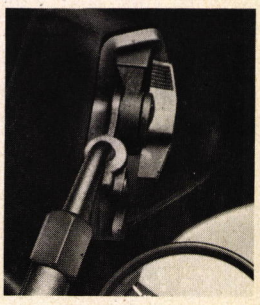

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Pit Bits

Ricky Graham winning on a Harley

You can find him in Honda's pits now.

• Graham national champion: Honda signed former AMA Grand National Champion Ricky Graham to its flattrack team for 1984. Graham, who finished second in 1983 in a bid to defend his title, will team with Bubba Shobert and 1983 Camel Pro Series Rookie-of-the-Year Doug Chandler.

• Movin' Muzzy: Shortly after Kawasaki canceled its Superbike program last fall, tuner Rob Muzzy packed his tool chest and went to Honda. Muzzy, one of the main forces behind Kawasaki's Superbike-winning effort in '81, '82 and '83, joins Honda's flattrack team and will put his tuning talents to work trying to find more horsepower in the air-cooled NS750 vee-twin.

• Add Honda: In a further reshuffling of Honda's flattrack deck for this year, former team director Jerry Griffith will maintain Doug Chandler's bikes only. Replacing Griffith as flattrack team director is Udo Gietl, who continues to wear the roadrace captain's hat, too.

• Honda on the road: Honda's roadrace team has been altered, as well. There will be three riders for '84, but no factory support teams. Formula 1 champ Mike Baldwin will pilot an RS500, while the Superbike team will consist of Fred Merkel alone. In a new development, though, former Formula 2 champ Sam McDonald will return to that class, riding a new Honda 250.

• Add Honda 250: Sources close to the project say Honda's new two-stroke 250 roadracer is a vee-twin. The project, said a company spokesman, was conceived after Kawasaki disbanded its Superbike team. Honda lost its adversary, and so elected to go hunting elsewhere. Because Yamahas have dominated the 250 class in America for so long, that class was the logical choice. So far, though, people at Yamaha haven't been quaking in their boots. As one Yamaha spokesman said, "From what I hear, the Honda 250 is a dog." It will be curious to see just how much fight there is in that dog.

• 1985 Yamaha Superbike: While Honda was busy rearranging its flattrack and roadrace decks, Yamaha was planning to deal itself into the Superbike series. Yamaha engineer Hiroshi Yamamoto returned to Japan last November and began work on the company's first-ever Superbike. Yamamoto was responsible for the XS1100's success in Australian production racing several years ago, and figures on doing the same—with a different bike, of course—in America. Most race insiders speculate that the Superbike will be based on the RD500, a bike that is not yet EPA-legal for America. In broad terms, Yamaha's Superbike plans hinge on the sales success of the RZ350. If the smaller two-stroke moves quickly off the dealer showroom floors, Yamaha will get the RD500 checked out by the EPA, and be ready for 1985 U.S.-delivery. From there, the big RD would go almost directly to the racetrack. After all, it's loosely based on Kenny Roberts' early-1983 OW70, and prepping it for Superbike racing would be a matter of applying some race hardware, new tires and decals.

• Superbike showdown: Now that Yamaha is arming itself for Superbike racing, the pit talk focuses on whether Kawasaki can afford to remain idle in a class that it previously dominated. It looks like Yamaha and Honda probably will be in the 1985 Superbike ranks, and all indications point to a Yoshimura-backed Suzuki effort as well. And if Kawasaki makes noises about returning to Superbike racing in 1985, privateer racers had better get their resumes in order. There are going to be plenty of vacant seats to fill.

• RZ350 world championship: Yamaha isn't funneling all its energy to the Superbike front. According to sources at that company, there's been talk of a Yamaha-backed RZ350 roadrace program. Basically, it would be the same type of series Yamaha already supports in Europe: The bikes are supplied and prepared by national distributors, and riders are selected on an invitational basis. Evidently, Kenny Roberts supports the program, and would even like to see the top American riders face the best RZ350 pilots from Europe.

• Kings of the hill: Earl Bowlby and Keith Grooms won the AMA's 1983 Hillclimbing Championships. Bowlby took top honors in the 750cc class, while Grooms climbed his way to the top of the 500cc crowd. —*Dain Gingerelli*

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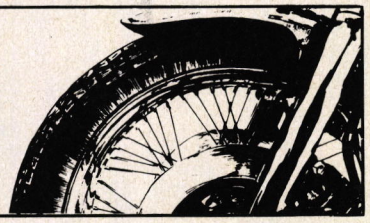

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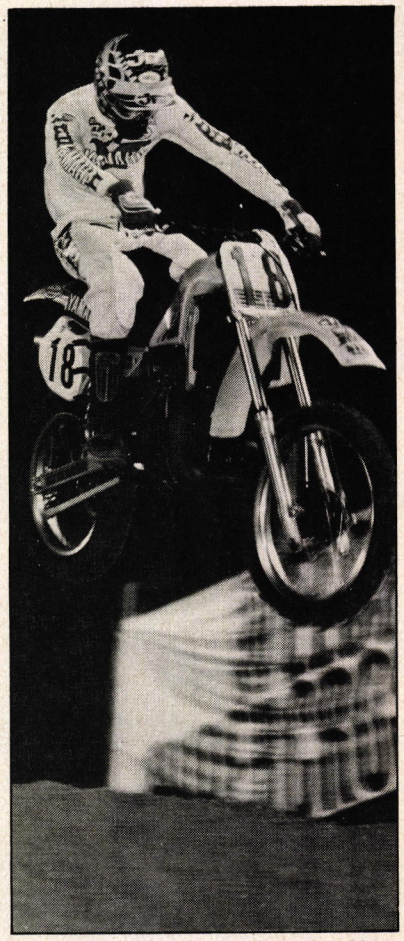


Ron Lechien was all business at San Diego

He gave a bonus win to Yamaha.

PHOTOGRAPHY © 1984 KEN TURIACE

• Ron Lechien is more than just a 17-year-old motocross racer with a fast throttle hand. He's an articulate young man with a keen business sense, too. And for 1984, Lechien's business acumen told him to change stock.

As a rider for Team Yamaha, Lechien figured the company's new policy of racing production-based motocross bikes for 1984 would be detrimental to his future. He had a performance clause in his contract that put an emphasis on his results: The better he finished, the more money Yamaha paid him. Lechien reckoned that riding production bikes

against factory specials from Honda, Kawasaki and Suzuki would not only hurt his racing but his income, as well.

So, by mutual agreement, Lechien left the team. He didn't sever all ties with his former employer, though. The contract was dissolved as of November 1, 1983, but there was one more race on the calendar, the CMC Trans-Cal Supercross in San Diego. And because Lechien lived in the San Diego area, he wanted to make that race. So for the San Diego Supercross, Lechien *bought* a 1984 Yamaha YZ250L, the same type of bike he would have ridden if he'd stayed with Yamaha.

Even so, Lechien was regarded as any other YZ rider, and Yamaha gave him technical assistance in preparing the bike. As Yamaha's race director Ken Clark said, "Our guys helped him modify it to be similar to ours. That included a new exhaust pipe, some cylinder porting and installing an Ohlins shock absorber." As for reducing the bike's weight, Clark claims the YZ250L is at the AMA minimum, so there was no need for any "unobtanium hardware," as he put it.

As a result of Lechien's gamble, he won the San Diego Supercross, perhaps

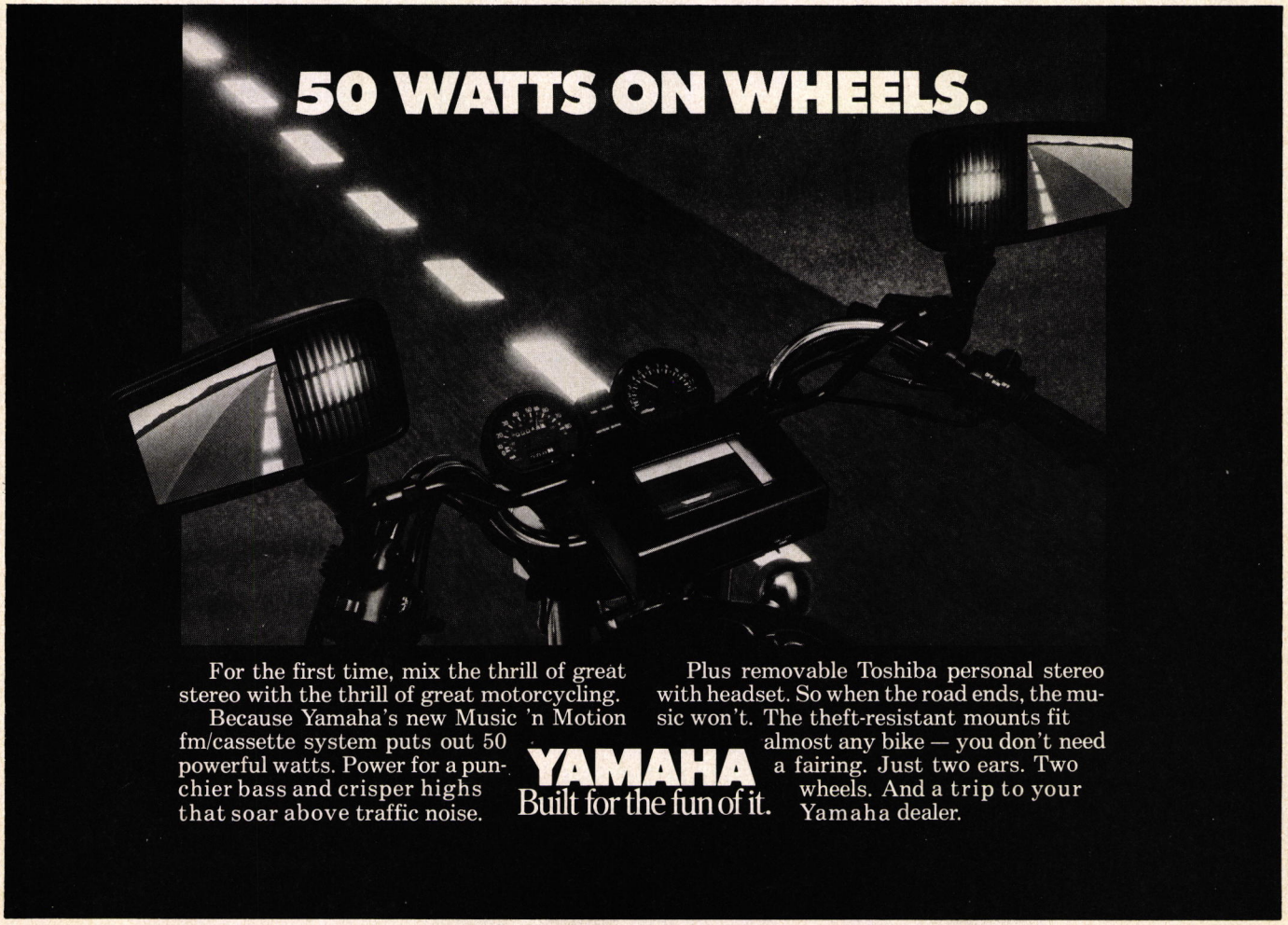
Yamaha's Broc Glover finished second

Mass-production tactics at San Diego.

inadvertently proving Yamaha's point that a production racer can win against factory specials. Even Lechien, who had to eat crow following the race, agrees that a *well-prepared* production bike can win. But he feels that would be true only in Supercross, where there is less emphasis on top speed, and more on midrange power and acceleration. It's the outdoor courses, he says, that give the edge to factory specials. "Outdoor tracks," Lechien said, "usually are faster than indoor tracks. Generally speaking, I don't think that production bikes can go as fast as factory racers."

And because Lechien was scheduled to ride the 125cc class for Yamaha this year, he figured the deck was doubly stacked against him. "It'd be really tough to win in the 125 class on a production bike," he said.

So for the next two seasons, at least, Lechien will ride for Honda as a member of the factory's 125cc and Supercross teams. And with Honda, he'll race on bikes that nobody other than his teammates will have, since Honda's philosophy is to give all the advantages it can to its riders. It's the same attitude that Ron Lechien, the businessman and motocrosser, favors, too. —*Dain Gingerelli* ●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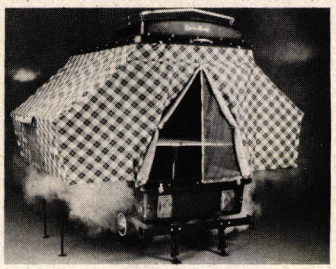

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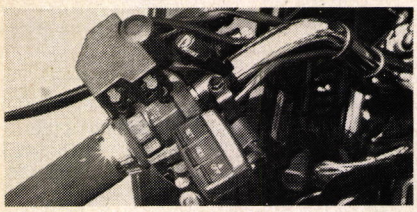

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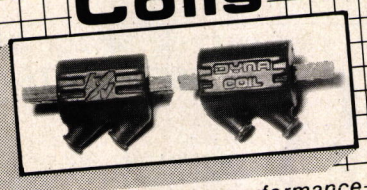

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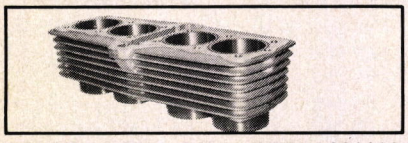

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LETTERS *More speed, More grief and More brutal truth.*

NOLO CONTENDRE

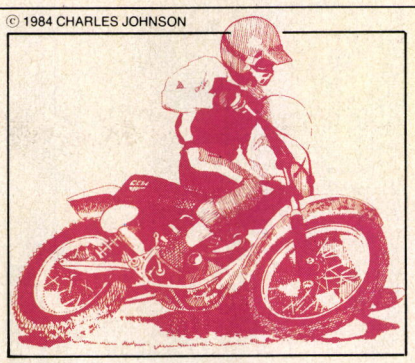
In regard to your article "The Fastest Streetbike Ever," (October 1983) I can't see why you didn't include the Honda CB1100F. In CYCLE GUIDE'S Cycle Guide in the same issue, you list the bike as having the quickest quarter-mile time and a 144-mph top speed, yet you didn't include the bike. You included two Kawasakis, the GPz1100 and 750 Turbo, two Suzukis, the GS1100ES and the Katana, and yet only one Honda, the V65 Magna. The V65 was a bit out of place with all the rest of those full-fledged sportbikes—it doesn't even have a fairing. The CB1100F was the perfect bike for this article.

Erick Doverspike
McKean, Pennsylvania

We thought so too, even though the CB1100F's 11.224-second quarter-mile time would have made it the slowest of the lot. But when we asked Honda for its quickest and fastest bikes, we got the V65—nothing else—ed.

UNFAIR ADVANTAGE?

In your search for the fastest streetbike, you looked carefully for the slightest discrepancy in performance on all the bikes. Yet I feel that when you look at professional racer Pee Wee Gleason's credentials you must give the Kawasaki 750 Turbo an immediate advantage over the other bikes. His involvement with American Turbo Pak made him a master at launching a turbocharged bike. I think it is safe to say that he more or less invented his own special technique for riding turbo bikes.



This may seem trivial to you, yet I feel this is a factor in a test like this. Gleason is the one person who can use the Kawasaki Turbo to its fullest. Average riders are hardly up to his standards. In the interest of fairness to the other bikes and to your average reader, it might have been more practical to use your staff dragstrip tester.

Craig Polzin
Menomonee Falls, Wisconsin

We were testing bikes, not riders, and as you say, "Gleason is the one person who can use the Kawasaki Turbo to its fullest"—ed.

MORE BRUTAL TRUTH

Now wait a minute Mr. West. I must strongly disagree with your philosophy ("The Brutal Truth," December 1983) that by being a young rider, I owe you "old timers" something for not having had to push my bike. Not all of us "kids" choose to ride the same bike 50,000 other people ride, and as a consequence I have paid for my originality by pushing my 1966 Triumph Bonneville more times than I care to remember. And as for the anxiety attacks, they are a way of life. I just keep telling myself that if it breaks, it breaks, and if I beat on the poor beast, it might break sooner.

Keith Vent
Cincinnati, Ohio

Continued

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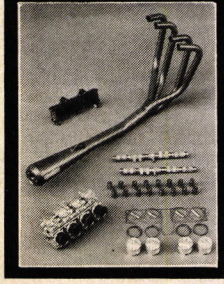

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LETTERS

EXHAUST TUNING

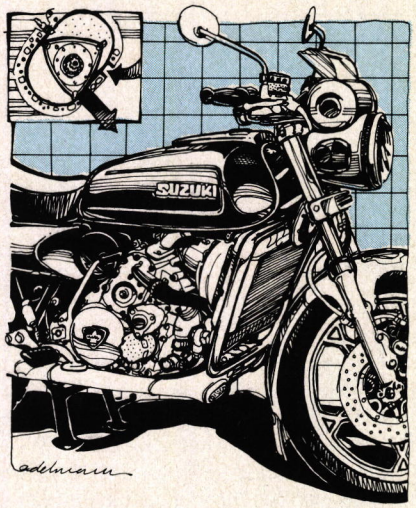
I was raised in the "big twin" era, when the somewhat uncivilized 650 Triumph was the ultimate bike. One of the best things about it was its sound. Today the bikes are so civilized and quiet that they are boring. But what if Honda, for instance, were to place two of its 600cc air-cooled singles together to produce a rip-snorting modern 1200cc replacement for the old exciting bikes of the 1950s? Only one additional thing would be required. Instead of tuning the exhaust for maximum power, a musician should tune it for its sound. At the very least, the factories should offer "off-road" pipes that would accomplish the same end.

Jon C. Arnold
Spokane, Washington

It's already been done, but not by Honda. A Harley-Davidson FXRS (669cc per cyclinder) makes some of the best sounds we've ever heard—ed.

ON THE NOSE

Ted West hit the nail on the head. My 1956 Norton Dominator 99 spent much of its life sitting at various locations in



New York City with gears, clutch plates, fiber generator gears and miscellaneous parts scattered along the curb. This was routine. Pulling a Norton or Triumph off the centerstand always put the rear tire squarely in an oil bath. But we knew our bikes, and when something went wrong we always knew where to look, because the same thing had probably happened before.

Recently I found myself staring at my inoperative Suzuki 850 at the side of the road. Granted, it's been a great bike for thousands of miles. But there was no quick fix, and tracing the problem at the roadside was almost impossible. It was a little scary, and now I do find myself a little nervous at times. Thanks for the great reading, Mr. West.

Brent Larson
Binghampton, New York

Sounds like a severe case of Brit-bike paranoia—ed.

SOLD HIS

My heartfelt thanks go to Ted West. I, too, had a case of the it's-gonna-break jitters so badly that I sold my five-month-old KZ550 for a sizable loss. I just *knew* that at any moment the cam chain was going to snap, or an adjusting shim was going to dislodge and leave me stranded in the middle of nowhere, in December, in the fog with freezing rain coming down and me in my T-shirt. I just *knew* it would happen. Of course, in 8000 miles, it never did.

Phillip Dennis Garvis
Woodbridge, Virginia

Did you ever own a Brit-bike?—ed.

TECHNICAL KNOCKOUT.

"The best new bike deal of 1983."
MOTORCYCLIST Magazine, Apr. 1983

The Suzuki GR650D's technical innovation and low price were so well liked at *Motorcyclist*, they just had to call it "The best new bike deal of 1983."

And now it happens to be selling for far less than ever before...during the Suzuki Knockout Savings Sale. In fact, there's a whole range of Suzuki street bikes on sale, most at hundreds of dollars off.

However, nothing lasts forever. Including the Knockout Savings Sale. So the sooner you get to your Suzuki dealer, the better. Because these prices can only stay in the ring so long before it's all over.

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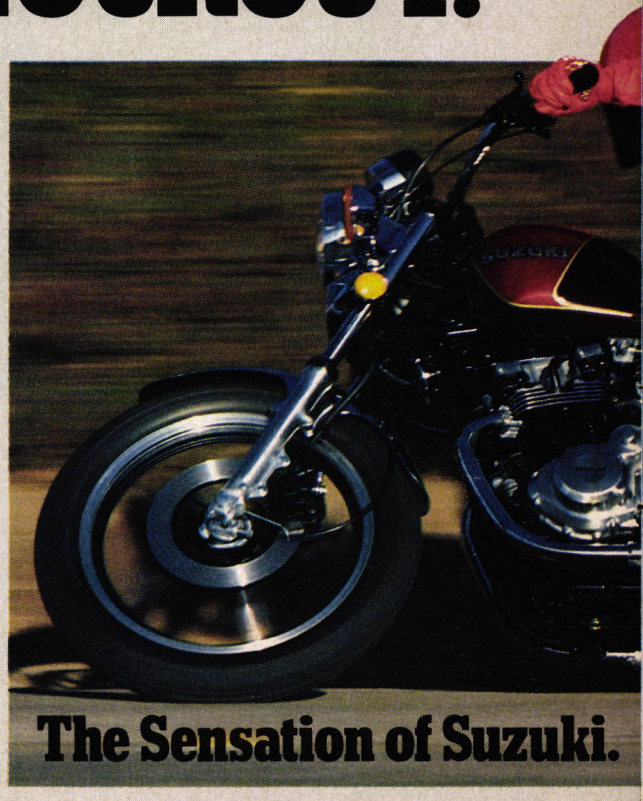

The Sensation of Suzuki.

CISCO KID

I have seen repeatedly in your magazine the term "ATV" (all-terrain vehicle) used for "ATC" (all-terrain cycle). I have enclosed a picture of an ATV, a six-wheel amphibious machine that floats, and a picture of an ATC. I did not know if anyone told you the difference between the two.

Lloyd Turner
Cisco, Illinois

We know the difference: ATC is a Honda trademark. No other manufacturer may call its product an ATC. Which is why we use the generic reference of ATV—ed.

CHAIN GANG

With all the attention paid to the newer shaft-drives, the newer, low-maintenance O-ring chains have not gotten the exposure they should. I traded a water-cooled shaft-drive bike (CX500) for an air-cooled chain-drive cycle (GS650E). Most people go the other way. So what's wrong with a little chain maintenance? O-ring chains are a big improvement over the old, non-O-ring chains. The O-ring chains last longer and need less frequent adjustment than the old style chains, and the new lubes have very little spatter, so the rear of your machine stays clean. Chain drive is also more efficient than shaft drive, and a chain has less unsprung weight than a shaft. Finally, a chain drive allows you to change the overall gearing, simply by changing the rear sprocket.

So, unless you do a lot of riding on dirt roads, or are super lazy, get that O-ring-chain-drive bike you really want, and don't put up with the disadvantages of a shaft drive.

Bob Koehler
Corning, New York

And if you don't want to know how good a shaft-drive bike can be, don't ride a Nighthawk S or K100 BMW—ed.

PLAIN WHAT?

Dain Gingerelli's Road Test of the GS650M Katana (November 1983) seems to have hit the mark. However, in the test, he casually refers to the GS650G as a "plain vanilla roadster" and says, "The shaft-drive 650G's purpose in life is puttering about town." Apparently, Mr. Gingerelli thinks that unless it is a purebred sportbike it is of no use to anyone.

My GS650G (my third bike) is less than eight weeks old, and already has more than 3800 trouble-free miles on it. Included in those miles is a 2500-mile trip to Denver that was a combination of Superslab and spirited mountain riding. A few minutes' worth of suspension adjustment on the 650G makes a simple transition from Interstate cruiser to canyon racer. If the 650M does not earn the name Katana it deserves to be blasted. However, the 650G is very good at what it claims to do, and does not deserve the cut.

Jon Cameron
Verona, Wisconsin

Point conceded. But what have you got against plain vanilla?—ed. •

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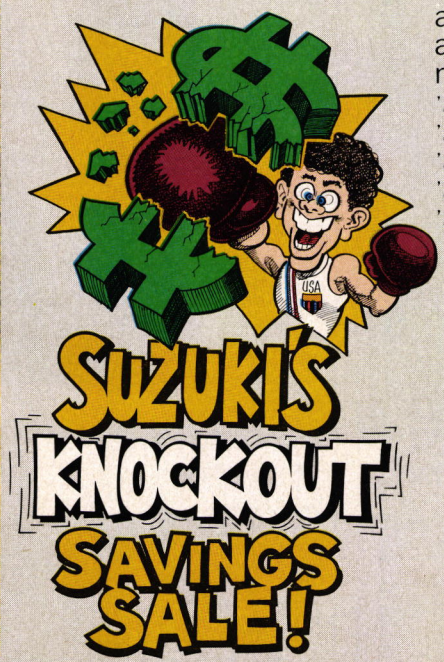

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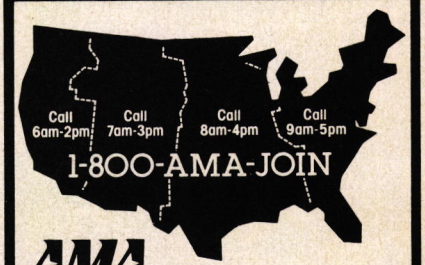

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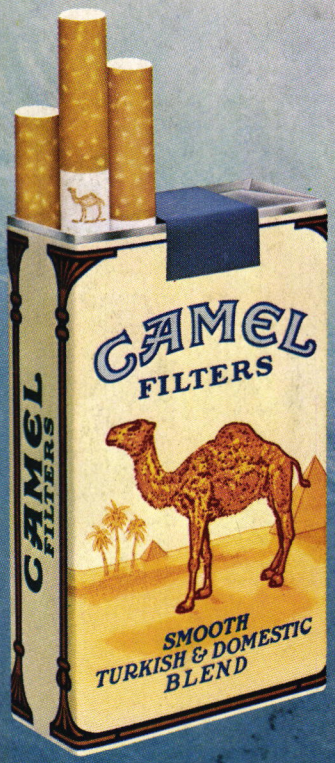

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